Pests

AND THEIR CONTROL

1943
OCTOBER
VOL. 11 NO. 10

ORGAN OF THE PEST CONTROL INDUSTRY

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Entomologists
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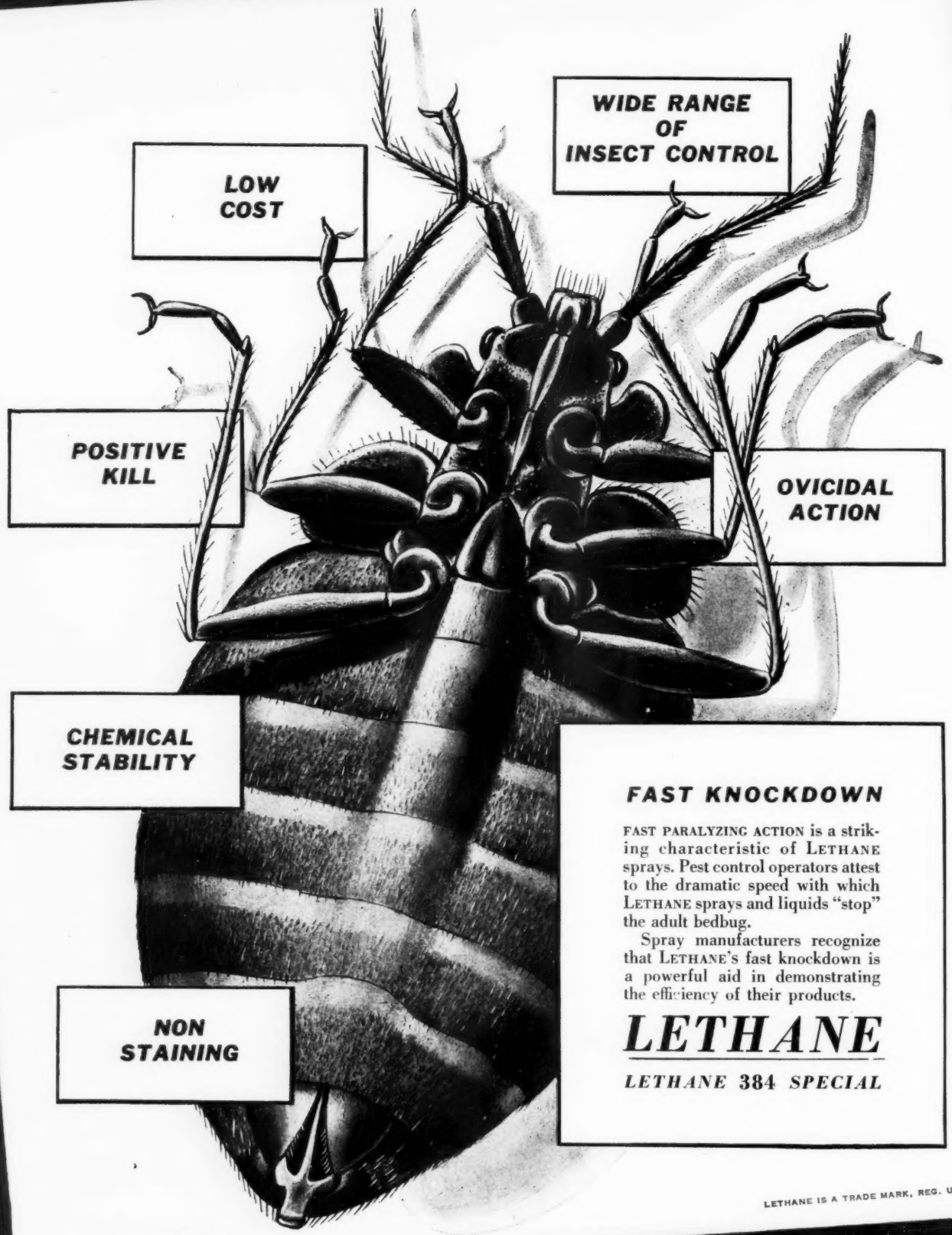

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Pests

and Their CONTROL

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

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STATEMENT

The National Association appreciates the co-operation given by way of publicity. The Association is not responsible for articles published unless credited to the Association. The list of officers and directors is published for informational purposes only.

For further details, communicate with

WILLIAM O. BUETTNER, Secretary
3019 Fort Hamilton Parkway **Brooklyn, New York**

CONTENTS

"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

Editorial 4-5

Pyrethrum Supplies for Home Front to Be Virtually Nil 5

PROGRAM War Emergency Meeting and Eleventh Annual Business Session 6

Studies of Methyl Bromide, Chloropicrin, Certain Nitriles and Other Fumigants Against the Bedbug 8
By Henry H. Richardson

ROTENONE ACTIVITIES: Future Prospects in Brazil and Peru 12
By E. C. Higbee

Local Organization News 16

2,2-Bis (Parachlorophenyl)-1,1,1-Trichloroethane 17

Care of White Mice and Rats 18

Control of Termite Attack Through the Use of Pentachlorphenol 19
By H. N. Anderson

What's New in Pest Control—Personals 21

Pyrethrum Allocations 31

Suppliers Comment on the Pyrethrum Situation 31

Write For These Booklets 34

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EDITORIAL

250 PCOs Can't Be Wrong!

CONSENSUS of responsible Industry opinion confirms the necessity for, and the essentiality of, NPCA's forthcoming War Emergency Meeting. Over 250, it is reliably estimated on the basis of reservations already in hand, will be present when Chairman Morton S. Prescott signals opening of the 3-day St. Louis War Emergency Meeting on the morning of October 25 at the Statler.

What, then, of the PCO, may we ask, the PCO who, because he has been preoccupied with problems of manpower, material shortages, War Production and other board rulings, to say nothing of income taxes, etc., has not yet deemed it advisable to declare or file his intention to attend? For his consideration we respectfully submit a review of some of the more compelling pros affirmatively influencing his colleagues. For instance there will be:

1. Constructive answers to many of your problems with respect to manpower, substitutes for critical insecticides, control techniques, rationing forms, priorities, allocations, rat-control projects, etc.
2. Off-the-record talks revealing important information of specific value in the conduct of your business—information available only to those in attendance.
3. Ample time, greater opportunity, "from the floor," for PCOs to exchange views, seeks answers to their individual business and professional problems, since there will be fewer and shorter talks from the platform.
4. Clinics, special symposia, round tables, etc. Sessions will run morning, noon, afternoon and night. (See complete program outline in this issue.)
5. Above all—major discussions, the nub of which will be the necessity for pest control and the place of the PCO in civilian defense and the Armed Forces.

"Now, needless to say, you won't go out of business if, by any chance, you do not show up at St. Louis; but, on the other hand, if you do, we'll guarantee that not only will it give you a lift, help you in your business, add to your knowledge, but also, in its ultimate effect, speed the war effort. Could there be four more impelling reasons?

"Meanwhile, time marches on. Pullman and hotel reservations should be made without delay; and in writing the Hotel Statler, it would be well to specify you expect to attend the NPCA War Emergency Meeting, otherwise adequate accommodations may not be forthcoming.

"We'll be seein' you at St. Louis, on October 25, we hope!"

Dr. Thomas E. Snyder Honored*

MANY, and especially those who have had the privilege of listening to Dr. Snyder's talks at various NPCA conventions or have read his book "Our Enemy . . . The Termite," will be pleased to learn that he has been elected president of the New Orleans Academy of Sciences, an affiliate of the American Association for the Advancement of Science, for the year 1943-4.

Founded in 1853, a year in which a terrible epidemic of yellow fever swept the city and meetings had to be suspended, the New Orleans Academy of Sciences has had many famous members in the past, among whom were Agassiz, Baron von Humboldt and J. Henry. Current academy programs cover subjects relating to the war.

In thus signally honoring one of its members, the New Orleans Academy of Sciences has also done honor to itself. In tendering good wishes and congratulations to Dr. Snyder, there is not much question that we echo the wholehearted sentiments of the members of the Industry, who, in turn, are to be congratulated on the fact that Dr. Snyder will be one of the principal speakers at the NPCA St. Louis War Emergency Meeting this month.

**Senior Entomologist, Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, New Orleans, La.*

George E. Sanders

FRIENDLY, amiable and able George Sanders is dead. After being hospitalized for less than two weeks, he died on August 17 at the middle age of 59. At the time he was owner-operator of the firm bearing his name located at Richmond Hill, N. Y.

If in recent years the Industry has added to its substance, grown in stature, gained in public respect, there will be none, we are sure, who will deny that part of the credit rightfully belongs to George Sanders. A lifelong student of entomological research, he has evolved a number of widely used formulas on insect control. He was a well-known Industry figure, his loss will be a grievous one.

Charter member of the NPCA, contributor of papers to Pests, speaker at several Regional PCO Conferences, Mr. Sanders at one time also served as assistant State Entomologist of Illinois for three years, and for eleven years he was in charge of all insecticide investigation for the Canadian Government.

A graduate of the University of Illinois and of the Ontario Agricultural College, Mr. Sanders had received honorary degrees from several colleges, including one from Harvard University. He had been granted many patents on insect control, of which, perhaps, the best known are "Copper Dust" and "Oxo Bordeau." He has also been quoted in many modern books on insecticides and in official publications the world over, including NPCA's Service Letters. Moreover, he has been elected to the following societies, held office in five of them, and elected to the Fellow and Active list of three:

Fellow American Association for the Advancement of Science.
Active Member American Association of Economic Entomologists.

Member American Phytopathological Society.
Member National Malaria Committee.
Member American Society of Tropical Medicine.
Member New York Entomological Society.
Member Entomological Society of Ontario.
Charter Member Canadian Society of Technical Agriculturists.
Charter Member Professional Exterminators, Inc.
Charter Member Society of Industrial and Consulting Entomologists.

Though Canadian born, Mr. Sanders was an American citizen at the time of his death. Representing the Industry at the funeral parlors, Richmond Hill, N. Y., before his body was shipped to Round Hill, Nova Scotia, where Masonic funeral services were held, were E. N. Goldey, Charles Opitz, Dave Weisburger, Chester Schwimmer and W. O. Buettner.

Of parenthetic though unusual interest is Mr. Sanders' distinguished grandfather (on his maternal side), the Hon. George Whitman, M.P.C. who, for sixty consecutive years, represented the Province of Nova Scotia in the Canadian Commons, thereby establishing what still constitutes a record for continuous service, by one individual, in that country's parliamentary history.

Surviving are his widow, Mrs. G. E. Sanders, who intends to continue the business, his mother, 86, of Round Hill, Nova Scotia, five sisters and a brother, to whom we extend our sincerest condolences.

Pictures Wanted for Use at War Emergency Meeting

WALTER S. McCLOUD, who is scheduled to speak on matters of "Rodent Control" and "Photography in Pest Control" at St. Louis this month, advises he "would like to receive for use at the War Emergency Meeting any and all pictures that had to do with pest control work, operators at work, damage done by rats, mice, roaches and termites; in other words, anything that will picture our business." He asks that members or others either promptly send such pictures to him to 612 N. Michigan Avenue, Chicago, Ill., or bring them along to St. Louis, or send them, in his care, to the Statler Hotel, St. Louis, timing them to arrive, if possible, on Saturday, October 23.

Your prompt cooperation will be of service; your courtesy appreciated.

Red Squill Now Coming From North Africa

IT IS our understanding that some first lots of RED SQUILL have arrived in this country from the Mediterranean area. This is the first material to come into the country in nine months. Further quantities may be afloat and additional stocks are reported at the port awaiting shipping facilities. It is hoped as a result of re-established commercial relations that adequate RED SQUILL will soon be available for governmental and civilian requirements. We hope that as stocks accumulate the matter of standardization to a definite mg/kg basis will be adequately considered, since it long has been the desire, if not insistence, of PCOs to be provided with high potency material so that results might be commensurate with the labor and effort applied in setting out RED SQUILL bait. (Service Letter No. 287 Appendix 1 of NPCA carried pertinent remarks about bioassay of Red Squill and a recent broadcast of the CPCO simplified comments on the same subject.)

Pyrethrum Supplies For Home Front To Be Virtually Nil

DROUGHT which severely damaged the pyrethrum crop last Spring in Kenya Colony, British East Africa, plus the unabated consumption of pyrethrum-based insecticidal sprays to control malaria-carrying mosquitos in war areas abroad, have caused the War Production Board to work out further control of available supplies. As a consequence it is expected pyrethrum supplies for home use will be almost nil.

On August 30, 1943, the WPB issued a revision of Order M-179, listing some important changes in the method to be used in applying for pyrethrum. Where heretofore orders have been sent to suppliers accompanied by a certificate of end use, and suppliers have made application for allocation, under order M-179, amended August 30, more specific information as to uses and needs are required and the buyer must file this with WPB on WPB Form 2945 (formerly PD600). This has been interpreted to mean that the possibility of allocation is probably more remote than ever because of the constantly growing needs of the Armed Forces abroad. The Army itself has practically eliminated the use of pyrethrum in continental United States and at base installations abroad. Substitutes are being used more and more, confining freon-pyrethrum-aerosol-mist spray to field forces, particularly in jungle areas.

It is gratifying to observe that WPB recognizes the service the PCO renders in the conservation of public health. This agency has made limited allocations of Pyrethrum Powder based upon importance of use and earlier allocations, if any. These quantities necessarily were most meager but the fact that 25, 50 and in some cases 100 pound lots were granted, is an indication that the essential work performed by the industry is not overlooked.

Of pertinent interest to the PCO are the following excerpts, from WPB Order M-179, as revised August 30, 1943, which include instructions for filling out the forms.

(Paragraph "e" **Consumers to furnish statement of use.** Each person who wishes to obtain pyrethrum from any producer in any calendar month, whether for his own consumption or resale, shall on or before the 10th day of the preceeding month, file a statement with respect to the intended use thereof. Such statement shall be made on Form WPB 2945 (formerly PD-600) in the manner set forth in the general instructions appearing on that form, subject to the special instructions contained in Appendix A to this order. If there is any inconsistency between the general and special instructions the special instructions must be followed.

(Appendix A) **Special Instructions for Customer's Form WPB 2945 (Formerly PD-600)**

1. **Obtaining forms.** Copy of Form WPB 2945 may be obtained at local Field Offices of War Production Board.

2. **Number of copies.** Prepare an original and two copies. Forward the original to the War Production Board, Chemical Division, Washington, D. C., Ref: M-179, forward one copy to the producer with whom your order is placed, and retain the second copy for your files.

3. **Information at top of form.** In the heading under "Name of chemical" specify "pyrethrum"; under "WPB Order No. ....." specify "M-179"; under "Indicate unit of measure," specify "pounds."

4. In the heading at the top of Table I, specify the month and year for which the delivery is requested.

5. In Columns 1 and 11 (Grade) specify form, that is, whether dust, powder or liquid extract.

(Continued on Page 27)

PROGRAM
War Emergency Meeting
and
Eleventh Annual Business Session

NATIONAL PEST CONTROL ASSOCIATION, INC.

HOTEL STATLER, ST. LOUIS, MO.—OCTOBER 25, 26, 27, 1943

IF THE CORE of any successful program is the character of its panel of speakers, then the program of the St. Louis "War Emergency Meeting", just released by the NPCA for publication, is an assured success. Each speaker, it goes without saying, is not only a specialist in his particular subject, but also knows how to present it in a manner that will prove instructive, constructive and informative.

The fundamental character of the program is one that hews close to the line of the basic needs of the PCO, thereby enhancing his ability to perform more efficiently his essential services in helping to protect the health of the civilian, the soldier, the sailor and in helping to prevent destruction of food and property. This is best exemplified by a cross-section of the program, giving some of the speakers, their business, professional or governmental connections, and the topic each will discuss. The other speakers on the program, needless to say, are of equal excellence and high repute.

DR. P. N. ANNAND
Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C.; President, American Association of Economic Entomologists. Subject: Wartime Program of the Bureau of Entomology and Plant Quarantine.

DR. RICHARD T. COTTON
Senior Entomologist, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Manhattan, Kansas. Subject: New Developments in the Conservation of Food from Insect Attack.

PROF. J. J. DAVIS
Head, Department of Entomology, Purdue University and Agricultural Experiment Station, Lafayette, Indiana. Presiding at Symposium: Pest Control and the War Effort.

F. E. CARLOUGH
Senior Biologist, Division of Predator and Rodent Control, Fish and Wildlife Service, United States Department of Interior, Chicago, Illinois. Subject: The U. S. Fish and Wildlife Service Brings Us Up to Date. (Rodent Control.)

DR. GEORGE E. GOULD
Associate in Entomology, Purdue University; Agricultural Experiment Station, Lafayette, Indiana . . . "Roach Clinic."

LT. COL. F. C. MORTENSEN
Sanitary Corps., U. S. Army; Station Hospital, Jefferson Barracks, Missouri. Subject: Pest Control and the Armed Forces.

GALEN C. ODERKICK
District Agent, Division of Predator and Rodent Control, Fish and Wildlife Service, U. S. Department of the Interior, Experiment Station Annex—Purdue University, West Lafayette, Indiana. Subject: Cooperative Experiment—Chicago, Ill. (Rodent Control.)

JOHN A. RODDA
Acting Chief, Insecticides and Fungicides Unit, Chemicals Division, War Production Board,Washington,D.C.

MISS FRIEDA SCHICHT
Secretary, St. Louis Rat Control Program, St. Louis, Missouri. Subject: Rat Control: A City Administration's Point of View.

DR. ROGER C. SMITH
Head, Department of Entomology, Kansas State College of Agriculture and Applied Science, Manhattan, Kansas. Subject: Factors Affecting Efficiency of Fly Sprays.

DR. THOMAS E. SNYDER
Senior Entomologist, Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture, New Orleans, La. Subject: Termite Control Progress.

JUSTUS C. WARD
Pharmacologist, Fish and Wildlife Service, United States Department of the Interior, Denver, Colorado. Subject: Research—Formulas in Wartime. (Rodent Control.)

THEME

PEST CONTROL—A Wartime Necessity.

(a)—Solution of insect and rodent problems confronting Armed Forces at home and abroad.

(b)—Protection of the Public Health.

(c)—Conservation of Food and Other Vital Stores.

Registration and General Information

Sunday afternoon beginning at 2:00 P. M., the Registration Desk will be conveniently located in the Daniel Boone Room, Mezzanine Floor and remain open until 9:30 P. M. Thereafter, the Registration Desk will be on the 16th floor near the entrance to the Ball Room. On Monday the registration desk will open at 8:00 A. M. and the following two days the opening hour will be at 8:30 A. M. Registration attendants will be on duty until 5:00 P. M.

Costs: Registration for every individual $12.50 whether you attend one or all sessions; ladies $7.50. Registration fee includes the dinner on Wednesday evening and other events but does not include the luncheons. Hotel, traveling and meals are left entirely to the dictates of your pocketbooks.

Invited if: You are directly or indirectly concerned with structural pest control service work, regardless of membership in the NPCA.

Tickets for the luncheons should be purchased in advance. The "deadline" for daily luncheon reservations will be 10:00 A. M. The charges per person per luncheon will be $1.50.

A convenient "Problems and Question" box will be at the Registration Desk. Any desiring questions to be answered, should deposit in the "Question Box."

PROGRAM

SUNDAY AFTERNOON—OCTOBER 24

3:00 to 5:00 P. M.—Informal reception at the Home of the Thomas C. Raleys'—106 Aberdeen Place, Clayton, Missouri.

(Continued on page 23)

N P C A: Greetings and Best Wishes for a Successful War Emergency Meeting!

CENTROBULB—*No!*

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Studies of Methyl Bromide, Chloropicrin, Certain Nitriles and Other Fumigants Against The Bedbug[1]

HENRY H. RICHARDSON,[2] *U. S. D. A., Agr. Res. Adm., Bureau of Entomology and Plant Quarantine*

THE control of bedbugs **Cimex lectularius** L., is particularly important under wartime conditions, since places where numbers of people congregate such as soldiers' barracks and sailors' quarters are favorable for the development of infestations. The likelihood of such infestations in aid-raid shelters in England was mentioned by Busvine (1941), and more recent reports (Great Britain Medical Research Council 1942) have confirmed this prediction. Although the bedbug does not seem to have been definitely incriminated as disease carrier under natural conditions (Hegner et al. 1938), the work of Milzer (1942) suggests that it may be an important vector of lymphocytic choriomeningitis (Anonymous 1942).

Laboratory studies have been made of the fumigation efficiency of a number of chemicals, including acrylonitrile (Richardson & Casanges 1942b), 1,1-dichloro-1-nitroethane (O'Kane & Smith 1941), and certain chloroacetonitriles (Peters 1940), that have recently been found toxic to various insects. Methyl bromide, chloropicrin, hydrocyanic acid, carbon disulfide, and 15 other fumigants have also been tested. Approximately 150 fumigations have been made in glass flasks and in a steel cylinder, on approximately 15,000 eggs and 30,000 nymphs and adults of the bedbug. These experiments are discussed in this paper.

Materials and Methods.—The bedbugs were reared in the laboratory by methods described by Woodbury & Barnhart (1939) and Campbell et al. (1941). The insects were kept at 77° F. and allowed to feed once a week on rabbit. Eggs up to 4 days old, first- to fifth-stage nymphs, and adults approximately 4 to 20 days old were used in the tests.

The chemicals tested are listed in table 1. In general they were of the best quality obtainable commercially, and some were of C. P. grade.

The fumigations were made by direct exposure of the insects to the gas either in a 12-liter glass flask by a method previously described (Richardson & Casanges 1942b) or in a 7.7-cubic-foot steel cylinder. Most of the chemicals, including liquid hydrocyanic acid, were measured under a hood with a micropipette to which was attached a hypodermic syringe lubricated with stopcock grease. Ethylene oxide and methyl bromide were measured with a gas burette in the flask tests, but the larger quantities needed in the steel cylinder were measured in a cooled, graduated glass cylinder.

In the flask tests the insects and eggs on a small piece of cardboard were placed in a shallow glass beaker and quickly lowered into the flask after the gas had been vaporized there. Preliminary tests indicated that it made little difference whether the insects were fumigated in the glass beaker, allowed to crawl directly over the floor of the flask, or placed in the flask and exposed to the lower pressure present during gas vaporization.

In the steel-cylinder tests the insects and eggs, on cardboard, were placed in an organdy-covered Petri dish and exposed directly to the fumigant, or the dish was wrapped in 6 to 8 layers of cotton batting to indicate penetrative efficiency in cotton-containing materials such as mattresses. The chemical was injected from a pipette onto a shallow pan at the top of the cylinder, where it vaporized. A small fan was run at very low speed for the first 10 minutes to distribute the gas. The slight increase in pressure due to vaporization was then relieved. With a number of the more toxic gases some final tests were made under loaded conditions by placing a barracks bag containing a 25-pound unit of clothing and blankets in the cylinder. The barracks bag contained 2 heavy woolen blankets (each weighing about 4 pounds), a heavy overcoat, a suit coat, trousers, a blouse, summer and winter underwear, socks, and shoes. This gave a load of approximately 3 pounds of clothes per cubic foot of space. A sample of bedbugs was wrapped in 8 to 10 layers of each blanket. One blanket was exposed directly to the fumigant, and the other was packed in the center of the filled barracks bag. Another sample of bedbugs was wrapped in 6 to 8 layers of cotton batting and placed beside the first blanket.

All fumigations were made for 5 hours at 77° + or — 0.9° F., atmospheric pressure and a relative humidity of from 50 to 95 per cent.

Usually about 100 eggs, 50 nymphs in the second to fifth instars, and 30 adults were used in each test. First instars were included in most of the earlier tests, but their use was discontinued because in general they were found to be less resistant than the older stages. After the fumigation the insects were kept in Petri dishes at near 77° F. The nymphs and adults were examined 1 and 6 days, and in some cases 10 and 20 days, after fumigation. The mortality observed on the sixth day was used in the final determinations, since most of the toxic action appeared to have taken place by that time. As a precaution, moribund insects present at that time were counted as alive although some of them may have died later. Examinations for egg hatching were made 15 days after treatment. Untreated control insects and eggs were checked at intervals during the work, but after 6 and 15 days, respectively, the mortality was generally negligible and no account was taken of it in calculating efficiency.

Efficiency in Glass Flasks.—Most of the chemicals were tested at three to six different concentrations, although some of the less toxic ones were given only one or two preliminary tests. From these results the approximate concentrations to give 95 to 100 per cent kill of the various stages were roughly determined. The 50 per cent, or median lethal, concentration of some of the chemicals was determined, but inasmuch as it cannot be used to forecast the concentration required for 65 to 100

[1]Early publication accorded this paper because of its war emergency value.

[2]The writer acknowledges with thanks the assistance of Maurice Wehr during part of the investigations, and the provision of a colony of bedbugs by F. L. Campbell, of Ohio State University.

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A HELPING HAND IN DIFFICULT TIMES

HIGH-KILL AMMUNITION IN THE FIGHT ON THE HOME-FRONT

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per cent kill (Shepard 1934, Richardson & Casanges 1942a), the emphasis was placed on the latter concentration, which is of major importance in practical control. The data are summarized in table 1.

To most of the fumigants, but especially to ethylene oxide and ethyl formate, the eggs were more susceptible than the nymphs or adults.[1] On the other hand, the eggs were the most resistant to dichloro-ethyl ether, and in the preliminary tests to trichloroethylene (confirming work reported by Busvine 1941), methylallyl bromide, and 1-nitropropane. The older nymphs were the most resistant stage to most fumigants. The active stages were generally used between 4 and 8 days after feeding, as it was found, with chloropicrin, that recently fed insects were less resistant — similar to the findings of Mayer (1934), Busvine (1938), and Gough (1940) with some other fumigants.

Table 1.—Toxicity of various chemicals as fumigants against various stages of the bedbug. Five-hour exposures at 77° F. (25° C.) in 12-liter glass flasks. Chemicals listed in approximate order of toxicity to the older nymphs.

Chemical	Approximate Concentration to Give 95 to 100 Per Cent Kill		
	Older nymphs	Adults	Eggs
	Mg. per liter	*Mg. per liter*	*Mg. per liter*
Hydrocyanic acid, HCN	0.4	<0.4	<0.4
Acrylonitrile, CH_2:CHCN	3–4	<2.5	2
Chloracetonitrile, CH_2ClCN	3–4	<3	<3
Chloropicrin, CCl_3NO_2	5–6	3	<2.75
a,ß-Dichloroethyl ether, $C_2H_4OCHClCH_2Cl$	5–6	5–6	>6
Acrylonitrile-carbon tetrachloride mixture (1:1 by vol.)[1,2]	7.5	6–7.5	6
1,1-Dichloro-1-nitroethane, $CH_3CCl_2NO_2$	8	<8	<8
Methyl bromide, CH_3Br	9	<7	<7
Dichloroacetonitrile, $CHCl_2CN$	10	<8	<8
Trichloroacetonitrile, CCl_3CN	11	8	<8
Ethylene oxide, $(CH_2)_2O$	14	6–10	<2
1-Nitropropane, $C_2H_5CH_2NO_2$[3]	—	—	—
o-Dichlorobenzene, $C_6H_4Cl_2$[3]	—	—	—
Methylallyl chloride (3-chloro-2-methylpropene-1), CH_2:$C(CH_3)CH_2Cl$	25–30	<25	<25
Ethyl formate, $HCOOC_2H_5$	30	25–30	<25
1-Nitrobutane, $C_3H_7CH_2NO_2$[3]	—	—	—
Nitroethane, $CH_3CH_2NO_2$[3]	—	—	—
Ethylene oxide-ethylene dichloride mixture (1:3 by vol.)[1]	35	25–30	<25
Tetrachloroethane-trichloroethylene mixture (1:1 by vol.)[3,4]	—	—	—
sym-Tetrachloroethane, $CHCl_2CHCl_2$	35	35	25
Methylallyl bromide (3-bromo-2-methylpropene-1) CH_2:$C(CH_3)CH_2Br$[3]	—	—	—
Carbon disulfide, CS_2	37.5	<30	30
Ethylene dichloride, CH_2ClCH_2Cl	>50	>50	>50
Ethylene dichloride-carbon tetrachloride mixture (3:1 by vol.)[1]	>50	>50	>50
Carbon tetrachloride, CCl_4	>50	>50	>50
Trichloroethylene, $CHCl$:CCl_2	>50	>50	>50

[1] Figures given are for the combined weight of both chemicals.
[2] On the basis of acrylonitrile only, the figures would be 2.5, 2.5–3, and 2 mg. per liter.
[3] Subjected to preliminary tests only.
[4] Slightly more toxic than tetrachloroethane on the basis of tetrachloroethane content only.

Hydrocyanic acid was the most toxic gas, the results being similar to those of Gunderson & Strand (1939) and others.

Acrylonitrile, which had previously been found very toxic to the confused flour beetle (Tribolium confusum Duv.) (Richardson & Casanges 1942b) was the next most toxic chemical. It had a slightly delayed action against the bedbug similar to that noted against the flour beetle. That is, bedbugs exposed to a killing dosage might appear to be affected slightly or not at all at the end of the fumigation, but all would be dead by the next day. Acrylonitrile is a colorless liquid with a boiling point of 78°-79° C., near that of ethylene dichloride, and is used in the synthesis of artificial rubber. It has a disadvantage in being somewhat flammable, but this can be overcome by mixing it with an equal volume of carbon tetrachloride. The addition of carbon tetrachloride also appeared to increase the toxicity, although this compound apparently was nontoxic at these concentrations. For example, in six paired tests with bedbug nymphs at various concentrations, but with each pair having the same dosage of acrylonitrile, the percentage mortalities were as follows:

Acrylonitrile	Acrylonitrile-carbon tetrachloride
0	40
10	37
36	68
58	98
58	88
76	100

Inasmuch as carbon tetrachloride probably acts also as a carrier to give gas distribution, as it does with other fumigants (Farrar & Flint 1942), its addition has several advantages.

The action of acrylonitrile on warm-blooded animals, according to Dudley & Neal (1942), is like that of a typical nitrile. Cleavage of the molecule probably occurs to produce hydrogen cyanide. They found dogs to be much more susceptible than guinea pigs, the minimum fatal dosage in a 4-hour exposure being near 0.24 mg. per liter for the former and 1.38 mg. for the latter. Dudley, Sweeney & Miller (1942) obtained no definite evidence of cumulative action in repeated exposures to low concentrations (50 to 150 p.p.m.). In an addendum to their paper Neal & Van Oettinger state that acrylonitrile and hydrogen cyanide seem to be of a very similar order of toxicity to warm-blooded animals on the basis of cyanide content. Until further information is gathered, they propose a maximum permissible concentration of 20 p.p.m. (0.043 mg. per liter) for acrylonitrile in an 8-hour exposure. This compares with the present accepted figure for hydrocyanic acid of 20 p.p.m., or 0.02 mg. per liter.

Chloroacetonitrile and the di- and tri-chloroacetonitrile are sneeze-type, non-flammable gases, recommended in Germany (Peters 1940) for control of bedbugs and other insects. Although chloroacetonitrile appeared to be the most toxic and was similar in toxicity to acrylonitrile, as was found with the flour beetle (Richardson & Casanges 1942), it had the disadvantage of being slow to vaporize. Trichloroacetonitrile, the least toxic of the three, appeared to have some delayed killing action between the sixth and tenth days after fumigation. Busbey et al. (1942) have recently found trichloroacetonitrile, to be more toxic than methyl bromide to the California red scale.

Chloropicrin, which showed high toxicity, has been reported as being much less toxic to the eggs than to the nymphs or adults (Bertrand, et al. 1919, Gunderson & Strand 1939, Peters 1939). The present data confirm the toxicity figures of Gunderson & Strand for the nymphs and adults, as well as being near though slightly higher than those of Sherrard (1942), but they show the eggs to be much more susceptible. In paired tests at various dosages the mortalities for older nymphs were 40, 45, 51, 55, 58, 60, and 65 per cent compared with 100 per cent kill of the eggs in all the tests except one, where it was 94. The higher toxicity to the eggs was also noted in other tests. Against the nymphs and adults chloropicrin appeared to have some delayed killing action from the sixth to tenth day after fumigation.

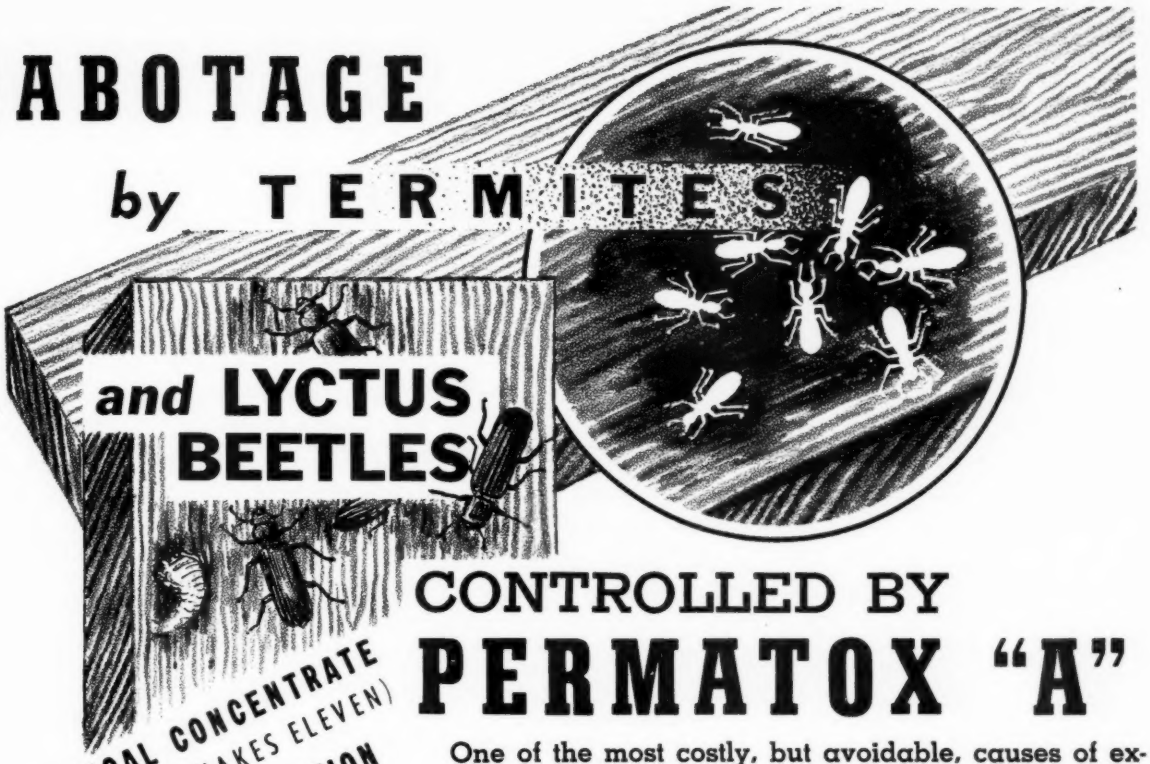
a.B-Dichloroethyl ether was among the more toxic chemicals, but it vaporized very slowly. It may be worth detailed study in some phase of bedbug control, such as in spraying vacant houses or houses that are to be demolished.

Ethylene oxide was not found so toxic to nymphs and adults as reported by Gunderson & Strand (1939), but the toxicity figures were near those of Busvine (1938). The concentration needed for killing the eggs was only about one-seventh, or less, that needed to kill

[1] The fact that the young, and probably more resistant, eggs were used in the tests should also be considered. Gough (1940) found young eggs to be more resistant than older eggs to sulfur dioxide fumigation, and this probably holds true for most fumigants.

(Continued on Page 23)

SABOTAGE *by* TERMITES *and* LYCTUS BEETLES



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ROTENONE ACTIVITIES:

future prospects in Brazil and Peru

By **E. C. HIGBEE**, *Agriculturist*
Office of Foreign Agricultural Relations
United States Department of Agriculture

IQUITOS, PERU.—With the use of rotenone restricted by Government order to a relatively small number of purposes, stockmen, farmers and the insecticide trade are naturally interested in what the U. S. Department of Agriculture is doing to increase supplies.

The war has cut off our imports of derris roots from the Far East. In 1940 U. S. imports of all rotenone bearing crude roots and powder were about 6½ million pounds, of which close to 50 per cent were obtained from the Far East. Since our entry into the war the Department of Agriculture has made every effort to cooperate with other American Republics to increase the rotenone production capacity of the Western Hemisphere.

In the initial investigations of rotenone production, the United States government applied facilities of several agencies to the problem. The Bureau of Plant Industry Division of Plant Exploration and Introduction, obtained from various sources propagating materials of certain rotenone-yielding insecticidal plants for trial. That Division and the Division of Drug and Related Plants, together with the Bureau of Entomology and Plant Quarantine and the Mayaguez, Puerto Rico station of the Office of Experiment Stations, persistently evaluated the insecticidal properties of many tropical plants of reputed value as insecticides or fish poisons. This involved extensive collection, identification, propagation, growing to maturity, sampling, chemical and toxicological evaluation of several hundred individual species of plants.

Derris Results Promising

The continued efforts of the Department have been most concentrated in the work of the Mayaguez station. The Mayaguez station has with the cooperation of other agencies of the United States and the other American republics distributed planting stock for some 110 acres of derris since January 1942 to growers in Central America, Brazil, Colombia, Ecuador, and Peru. These derris varieties yield an average of 5 to 7 per cent rotenone in Puerto Rico. There they reach a harvestable age in two years and produce from 800 to 1700 pounds of dry roots per acre. Clones of even better strains of derris were obtained by that station from the Goodyear Rubber Plantation Company of Panama. These clones are being increased rapidly so as to provide planting stock for commercial growers.

Derris cuttings of a diameter smaller than a lead pencil have not proven satisfactory planting material in field plantings in the past. Consequently large quantities of vines have been discarded as useless. The Office of Foreign Agricultural Relations, cooperating with the Mayaguez station, has found that with a root promoting hormone treatment these small cuttings are useful planting stock.

Lonchocarpus Also Studied

In addition to the work on derris, the Mayaguez station is searching for high rotenone yielding lonchocarpus plants, using a large number of varieties and species obtained from South America about five years ago. At present a clone which has produced 16.7 per cent rotenone is being multiplied by budding.

The principal rotenone producing countries in the Western Hemisphere are Peru and Brazil. The two plants being exploited in these countries are **Lonchocarpus utilis** and **L. urucu.** These plants are native to the Amazon Valley where they have been used by Indians for fish poisoning purposes since very ancient times. In Peru, specimens of lonchocarpus roots have been found in the tombs of the Incas.

In 1942 the United States Department of Agriculture sent two scientists to Brazil to cooperate with the Brazilian Instituto Agronomico do Norte at Belem which is under the direction of Dr. Felisberto Camargo, prominent entomologist of that country. The purpose of this cooperation was two-fold. First, to make botanical collections of all plants of possible insecticidal value in the Brazilian Amazon in the hope that new resources of rotenone or equally effective insecticide plants could be found. This is a long-time program and the continued assistance of the United States Department of Agriculture is expected to yield good returns. The second purpose of the mission was to determine the extent and possibility of immediate expansion of the sources of lonchocarpus plants being exploited commercially. As a result of this study of commercial sources of lonchocarpus root it was observed that supplies were decreasing rather than increasing. This occurred in spite of the fact that the Commodity Credit Corporation guaranteed a price of 17 cents a pound for roots of 5 per cent rotenone content f.o.b. Belem and 21.5 cents for powder of the same quality. These prices were approximately double the pre-war quotation.

Brazilians Cooperate

It was concluded that the decline in production was due to a local export embargo on whole roots. All roots leaving the State of Para were obliged to be milled, and millers were not paying prices to root producers sufficiently high to encourage new plantings. Subsequently, through action initiated by the Instituto Agronomico do Norte, the export embargo was removed and the Instituto cleared approximately 250 acres of land on which it is propagating planting stock of high rotenone-yielding lonchocarpus for distribution to plantation owners in the Amazon Valley. A large number of growers indicated their enthusiasm for this project when they were assured they could market their roots directly at the price guaranteed by the Commodity Credit Corporation. A gradual increase in exports of rotenone from Brazil is expected to develop.

At the same time the Instituto Agronomico do Norte began a program of plant selection in the hope of securing clones of high rotenone yielding lonchocarpus plants. Amazonian lonchocarpus plants used for this selection work were obtained from plants assembled in Belem. Chemical analyses of these plants are going on at the

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present time. To date the Instituto has selected many promising individuals. The roots of one tested more than 20 per cent, while several plants contained more than 14 per cent rotenone.

Peru Holds the Lead

At the present time Peru is the principal exporter of rotenone products to the United States. The bulk of Peruvian exports are crude roots. At the present time there are approximately 6,000 acres planted to lonchocarpus in the Peruvian Amazon. The present planting rate has been estimated by Sr. Guzman Cepeda of Iquitos at about 3,000 acres a year. This phenomenal planting rate is due to guaranteed future prices fixed by contract between the Peruvian Government and the Commodity Credit Corporation. Most of the plants in the ground are less than two years old and so are not of marketable age, which in the case of lonchocarpus is usually three years. Average yields are 1,500 to 2,500 pounds of dry root per acre. Within a year Peruvian exports will begin to increase heavily.

Under the direction of Ing. Pardo Arevalo of the Instituto Technico del Oriente at Iquitos, the Peruvian Department of Agriculture also has recently begun a lonchocarpus plant selection program. The United States Department of Agriculture, through the Cooperative Experiment Station in Peru, has assigned a scientist to this work and others will be assigned as needs arise. A large number of plant from production centers where high quality roots are known to exist will be planted in an introduction garden in Iquitos. The roots of each individual will be analyzed separately. It is expected that in a relatively short time several clones of the superior plants will be established. These will then be propagated and distributed to growers in the same manner as is being done by the Mayaguez station and the Instituto Agronomico do Norte.

Rotenone is at the present time a very valuable cultivated export item of Amazonian Peru. The relative importance of rotenone roots in the export trade of the Peruvian Amazon is indicated by the following table of principal items, except lumber, exported from Iquitos to all countries in 1942. The figures are taken from a publication of the Iquitos Chamber of Commerce.

Tagua nuts	1,605,585	Kilos
Barbasco (rotenone roots and powder)	1,595,673	"
Lechi caspi (chewing gum)	1,064,149	"
Cotton	409,370	"
Coffee	28,000	"
Rubber	12,673	"

Other Possibilities

In Ecuador the Ecuadorian Development Corporation has begun a vigorous derris production program. It is expected that by 1945 more than 2,000 acres of derris will be cultivated by the Ecuadorian Development Corporation.

Of special interest to investigators in the United States is the plant "devil's shoe string" botanically known as **Tephrosia virginiana.** For many years the Division of Drug and Related Plants of the United States Department of Agriculture has conducted studies on this United States native rotenone producing plant. Strains of this tephrosia are being developed which promise to provide material satisfactory for insecticidal use. If it is found that such a type retains this quality when grown under a variety of conditions, tephrosia may possibly become a satisfactory cash crop on poor sandy lands in the southern states.

—AIF News.

Step by Step to Inspection Fees

By **R. E. HACKLEY**

The day when charging for termite inspection will be the accepted and general practice seems to be drawing nearer. When this question came up at our annual meeting in February, 1943, an informal ballot unanimously favored charging for inspections. No hand was raised in favor of free service. However, in the short discussion that followed it developed that free inspections are such a controversial matter in some localities that discussion of the subject is taboo. But brighter days were ahead.

The subject was soon brought to our attention again by President Parsons in the MONTHLY. Since that, progress has been most encouraging. A feeling of unity on the subject is appearing. Contributors to the PCO News have supplied several excellent articles in favor of charging for inspections and no one has come forward in print in defense of free service. With this fine start let us keep up the good work and by friendly persuasion try to reduce the free inspection habit.

As this work progresses, we are likely to find some difficulties. For instance, an "inspection," a "report," "plans and specifications," an "estimate," and a "bid" are separate and distinct things. Too often the public and even the operators make the mistake of lumping them together. This confusion is the source of much trouble and curing it is not going to be any too easy. But if we can't arrive at Utopia at once, we may be able to get there by degrees, by doing one thing at a time.

Fortunately, there is one simple thing that we can do that will help a great deal. If we will do that first, the rest of the going will be much easier. Let us stop using the word 'free" in advertising and soliciting business. When the telephone man comes in to get your renewal, tell him to omit the word "free" from your ad. In the next printing of letterheads, forms, and publicity matter leave out the word. And stop using it in conversation with patrons and prospects.

Let's take one step at a time and let the first one be the cutting out of the use of the word "free."—C.P.C.M.

His Honor Squirms at Trial As Wood Tick Tickles Midriff

U. S. District Judge George A. Welsh began to squirm during a counterfeit money trial recently.

An attorney questioned the witness and the judge shifted to one end of the bench. The witness answered and his honor moved to the other end. The trial continued and so did the squirming.

Sprints to Chambers

After a few minutes the jurist, who at 64 thinks nothing of a 15-mile hike from his office to his home in Media, rose, called a brief recess and sprinted for his chambers.

He doffed his robe, dug through his clothing and finally reached the cause of his troubles—a wood tick attempting to burrow into his abdomen.

Dignity Restored

The judge then rearranged his robe and his dignity, returned to the courtroom and resumed the trial.

The defendant, James A. Hoffman, 33, Wharton St. near 8th, is charged with being one of the principal distributors of counterfeit $10 and $20 bills which were passed on shopkeepers in Germantown several months ago. The trial will be resumed Monday.

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By: H. E. Whitmire

WHITMIRE RESEARCH CORPORATION

LOCAL ORGANIZATION NEWS

San Francisco-Oakland Operators Meet

A joint meeting of the San Francisco and Oakland districts together with members of the Structural Pest Control Board was held at Downtown Cafe in San Francisco the evening of July 20.

E. O. Corson reported on the year's work of the Board, and gave the information that he had inveigled or coerced the board members into assembling 50 copies of the pest control manual.

John J. Gould, board member from San Francisco, reported on the importance of considering structural pest control in structural planning.

Dave G. Rennie spoke on the trend away from free termite inspections, and the present general acceptance of the paid inspection.

John Martin described housing conditions in the booming city of San Diego which in less than two years has increased from 166,000 to 400,000 population.

Twenty five members of the industry from the San Francisco Bay area were present at the meeting.

New England Pest Control Association Meets

An open meeting of the N.E.P.C.A. was announced by its president, Mark Weintraub, for October 5, at the Hotel Lenox, Boston, Mass. Dr. Vlado A. Getting, Commissioner of Public Health for the State of Massachusetts, was to be the guest speaker, his subject "Public Health Activities in Massachusetts." Especially invited were the field men attending the Northeastern Regional Conference of the Rodent Control Division of the Fish and Wildlife Service.

Scheduled for preview showing, through the good offices of George B. Lay, District Agent of Predatory and Rodent Control of the U. S. Fish and Wildlife Service, was the latest U. S. Government color film "Rat Control," a film not yet released to the public, and one which contains much valuable information.

Cincinnati Operators

The third meeting of Cincinnati Pest Control operators was held on August 24. General matters of interest pertaining to the industry were discussed. Among those present were Robert C. Yeager, Charles Cushing, H. Scherzinger and Theodore Oser.

Airplane Runways Damaged by Ants

By **W. M. GORDON,** *Naval Air Station, Corpus Christi, Texas*

The Red Harvester Ant **Pogonomyrmex barbatus** var. **molefacieus** (Buckley) has caused some damage to airplane runways at several of the Auxiliary Naval Air Stations near Corpus Christi, Texas.

This species is common in this area and their circular, flat, bare nests may be readily seen in the grain and cotton fields and pastures. The runways have in many cases been built over these nests, and as many as 25 to 30 have been discovered on a runway measuring 2,500 feet long by 300 feet wide. When aircraft taxi over these nests, which are a network of tunnels and chambers under ground, the weakened areas give way and depressions form on the runway. These depressions are 2 to 4 inches deep and 18 to 24 inches in diameter. The nests are frequently found in the center of a runway opening on the surface. The fact that this ant is not a moundbuilding species makes the job of locating the nests a difficult one, and what soil is brought to the surface of the runway is nearly always blown away by the plane. The runways which are constructed of a 4-inch caliche base and a 1-inch "hot topping" of hot tar and gravel, are unable to stop these determined insects from making their exit.

Control consisted of driving a pole (size of broom stick) through the crust until the point was among the galleries of the nest. This was easily determined by the ease with which the point passed through the cavities. The pole is removed and 4 to 6 ounces of carbon disulphide is poured into the hole; or granulated calcium cyanide is pumped into the hole by means of a foot pump. The opening is then sealed with a piece of sod.

Nearly 100 per cent control has resulted from the use of either of these methods on the first application and never more than two applications were needed to destroy a nest completely.—5-14-43.

—*Journal of Economic Entomology.*

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Epidemic of Fever Spreads in Hawaii

Dengue Invades Honolulu and Army Widens Out-of-Bounds

Honolulu, T. H.—The epidemic of dengue fever, which was confined to the Waikiki Beach area, has spread and become city-wide with thirty-nine cases reported, and the Army today barred military personnel from six more residential districts.

Meanwhile the Army Chemical Welfare Service is spraying thousands of gallons of insecticide in homes where cases are reported. In addition, the city's 7,000 air raid wardens are conducting a house-to-house check in an effort to eradicate breeding places of the dengue-carrying day mosquitos.

The Waikiki area, a favorite recreation center for men in the armed forces, is comparatively deserted.

Military police and the Navy's shore patrol are halting soldiers and sailors at all entrances to the restricted Beach district.

N. Y. Times.

Dow Appoints

The officials of Dow have appointed Clayton S. Shoemaker as Eastern Sales Manager and Frederick A. Koch as Assistant Eastern Sales Manager. Mr. Shoemaker has been associated with Dow for a number of years and has occupied various sales executive positions with the company. Mr. Koch has been Assistant Manager of the New York sales office for 15 years.

Announcements will be made in the near future on the opening dates of new offices in Boston and Philadelphia. It is expected that sales offices will be located in other important cities at a later date.

Mr. Shoemaker announced today the appointment of Alexander Leith, Jr., as Manager of the Philadelphia office and Alfred A. Lawrence as Manager of Dow's Boston office. Both Mr. Shoemaker and Mr. Koch, however, will make their headquarters at 30 Rockefeller Plaza, New York City. Mr. Ralph Dorland continues in charge of the New York office.

EXPLOSIVES TO KILL MOSQUITOES

Robert D. Glasgow, New York state entomologist, has proposed the use of explosives to exterminate mosquitoes and other insects in military areas. Charges of insecticide materials from mortars are effective, according to reports, and more practical and less costly than spraying.

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Telephone: WAdsworth 7-3300-1

2, 2'- Bis (Parachlorophenyl) - 1, 1, 1 - Trichloroethane

THIS is the rather formidable specific name for one chlorinated diphenyl ethane which is now receiving a great deal of attention from the insecticide industry. The compound is made by condensing chlorobenzene and chloral in the presence of sulfuric acid. It is a white powder, practically odorless when pure, insoluble in water but readily soluble in alcohol, kerosene, and other organic solvents. Although first prepared about 70 years ago in one of the German universities, only recently has its value as an insecticide been discovered. Credit for this development goes to J. R. Geigy, S. A., of Basle, Switzerland. 2,2-Bis (parachlorophenyl)-1,1,1-trichloroethane has been marketed in Switzerland for use as an agricultural insecticide in the forms Gesarol Dust Insecticide and Gesarol Spray Insecticide. There has also been marketed in Switzerland under the name of Neocid a louse powder.

In September 1942 the British Patent Office granted two patents to Geigy covering the use of this and certain related compounds as insecticides. British Patent 547,874 describes a method of making 2,2-bis (parachlorophenyl)-1,1,1-trichloroethane as well as other chlorinated compounds and of compounding these with talc or clay to form solid insecticidal compositions. British Patent 547,871 describes methods of emulsifying these materials in water. The product imported from Switzerland is commonly referred to as GNB, meaning Gesarol Neocid Base. The manufacture of this compound is being undertaken in the United States and trial lots of this domestic product have received the designation GNB-A. Recently authorities in Great Britain and the United States have decided to employ for this chemical compound the designation DDT, based on one of its chemical names—namely, dichloro-diphenyl-trichloroethane.

A great deal of experimental work by various agencies is now under way to determine the insecticidal possibilities of this compound. The investigations to date are being conducted mainly by the Bureau of Entomology and Plant Quarantine because of the opportunities that bureau has for testing against a great variety of insect pests and because of the relatively limited amounts of the material which have been available. The material is distinctly toxic to higher animals when taken by mouth and extensive toxicological studies are being pursued. Insecticide manufacturers would do well to keep an eye on 2,2-bis (parachlorophenyl)-1,1,1-trichloroethane, which already has shown remarkable toxicity against certain pests.

The foregoing is for informational purposes only, since compound "DDT" has gone to war and is not available for civilian use. . . . U. S. Patent 2,329,074 was granted Geigy, September 7, 1943.—Ed.

Fast Knockdown --- Positive Kill
Residual Action --- No Priority Needed

PYRE-THANE

A Substitute For Pyrethrum Powder
For Your

ROACH POWDER

Pyre-Thane—is Spent Pyrethrum Flowers Fortified with Lethane No. 60

Non Toxic to warm Blooded Animals

200-250 Bbl.	35c Per lb.
100 lb. Drum	38c Per lb.
50 lb. Drum	40c Per lb.
25 lb. Drum	44c Per lb.

Bosley's Roach Powder Containing

20% Pyre-Thane
50 % Sodium Fluoride
30 % Talc
100 lb. Drums ..... 25c Per lb.

Conserve Critical War Material

A. D. BOSLEY COMPANY
INDIANAPOLIS 5, INDIANA

Care of White Mice and Rats

Prepared in the Section of Fur Resources
Division of Wildlife Research

WHITE mice and rats are raised principally for use in medical laboratories in testing remedies and in determining certain types of disease; though they are also raised as pets. The information in this leaflet is based chiefly on the food and breeding habits and the housing requirements of white mice, but it will apply in a general way to white rats also.

Food

Many commercial firms that raise white mice and rats feed them specially prepared pellets containing a variety of ground cereals and soy-bean meal or other protein supplements. These can be obtained from a local feed dealer. A mixture of whole grains and soybean pellets may also be fed. Lettuce, chickweed, or other green feeds, and boiled carrots, potatoes, or parsnips should occasionally be furnished in small quantities, and fresh water should be supplied in every cage. All dishes should be kept clean and should be disinfected frequently by scalding.

Breeding

The mice and rats attain sexual maturity at 2 to 3 months of age. The gestation period is about 21 days. Females produce litters of about 5 young every 30 days until they are about 18 months old. Usually, however, it is better not to breed them again until they have ceased nursing the previous litter, for they soon break down under the strain of supporting two litters at the same time. The young are weaned when 20 to 25 days old. Under this plan each breeding female would produce successive litters at intervals of 6 or 7 weeks, and in the course of a year would produce about 40 young. Each male may have in his cage 3 or 4 females if they are without young. Each female is removed to a separate cage before the young are born and is kept there until the young are weaned. The mice and rats are suitable for laboratory use when they are 6 weeks old.

Cages

Experiments with both wooden and metal cages have shown that, other conditions being equal, better results will be obtained in a large colony of white mice or rats by using wooden cages. The cages should be about 16 inches long, 14 inches wide, and 10 inches high, inside measurements. The front, back, and bottom should be made of galvanized-wire netting of ¼-inch-square mesh, and the bottom should be so constructed that a dry pan can be placed underneath. Clean straw or shavings pro-

(Continued on Page 20)

THE TOX-EOL SYSTEM

Pioneered the Use of

CHLORINATED PHENOLS FOR TERMITE CONTROL WHICH ARE NOW UNIVERSALLY ADMITTED TO BE HIGHLY EFFECTIVE FOR BOTH SOIL POISONING AND WOOD PRESERVATION

CHEMICALS AVAILABLE FOR PROMPT SHIPMENT

"TOX-EOL"—6 Liquid Concentrate

To be diluted with 6 parts cheap petroleum distillate or even crankcase drainings. Almost stainless and leaves no persistent odor. Used for both ground and wood treatment in the "TOX-EOL SYSTEM" of TERMITE CONTROL.

CRE-O-TOX "S" 9 Liquid Concentrate

To be diluted with 9 parts WATER. For soil poisoning only. Contains not only one but 3 recognized effective soil poisoning chemicals. May be used in conjunction with "TOX-EOL"—6 in the "TOX-EOL SYSTEM."

WRITE TODAY FOR DETAILS of 5-year Warranty and Dealer Co-Operation Plan.

"PHOSPHOR-KILL" Zinc Phosphide Paste for RATS, MICE, etc.

Contains 7% to 8% zinc phosphide. Readily diluted to mix with bait. Sample 1-lb. can, 50c postpaid. 5 lbs. $2.00—10 lbs. $3.75, f.o.b. Memphis.

CRE-O-TOX CHEMICAL PRODUCTS COMPANY

Insecticides & Fungicides

MADISON AT WILLETT **MEMPHIS, TENNESSEE**

Control of Termite Attack Through The Use of Pentachlorphenol

By H. N. ANDERSON*

THE DAMAGE caused by Subterranean termites amounts to millions of dollars annually, most of which could be saved through good construction methods and effective soil poisoning. Termites eat cellulose found in wood, fibreboard, and paper, and continuously need moisture to survive. If we can prevent the movement of termites between cellulose and moisture, we can control their attack. This can be accomplished through the effective use of mechanical barriers and Pentachlorphenol, soil poison and wood preservative.

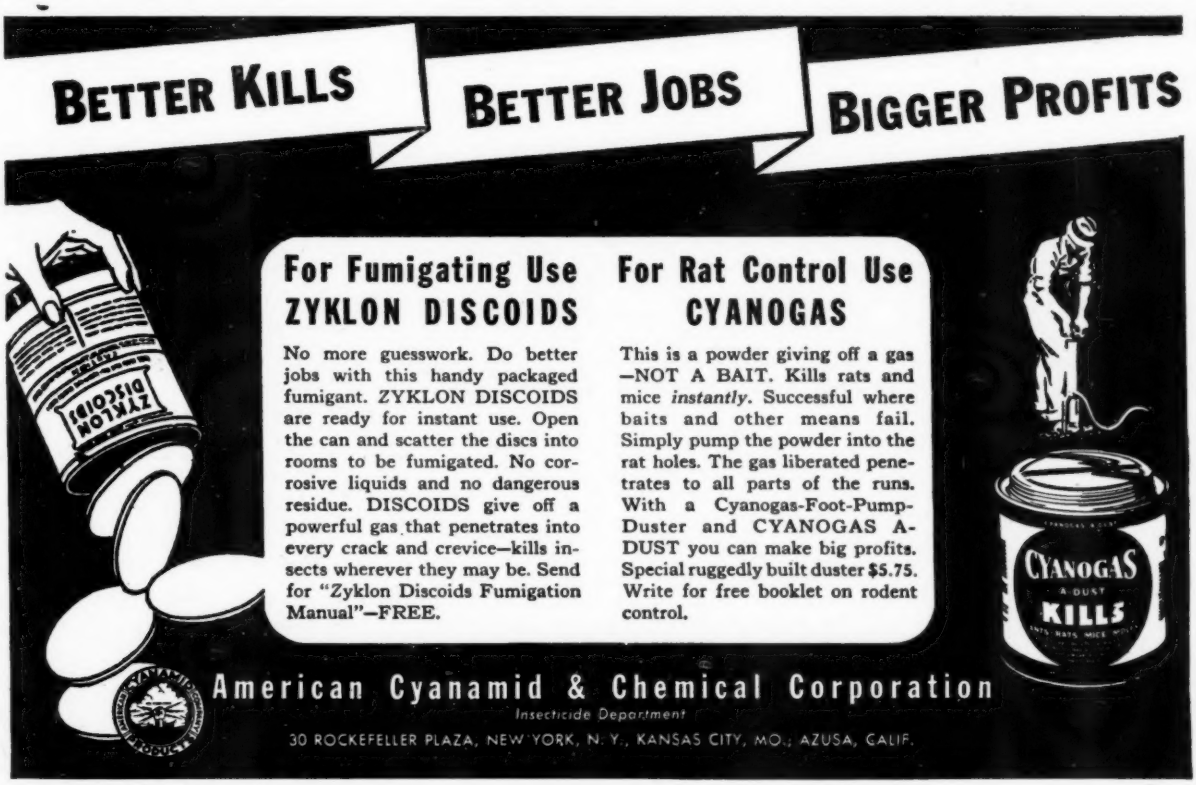
In order to combat an enemy we must know how he operates and then scheme to overcome him. So it is with termites. If we can obtain a working knowledge of their habits we are on the way to their control. Years ago termites apparently were not as prevalent as they are today because homes were built with heavy, thick foundations, the high grade timbers of heartwood were less palatable, and the houses were to a large extent unheated. Man has been kind to termites by heating with basement furnaces and equipping homes with heating pipe systems which promote the necessary conditions for development of termites, that is, heat and humidity in the adjacent soil.

Termites naturally have developed fastest in hot, humid climates with the result that the worst damage has always been along the Atlantic and Gulf coasts and the Coast of California. However, termites are also prevalent in the lower Missouri, Mississippi and Ohio River valleys, and on the entire Pacific Coast where the warm trade winds tend to increase heat and humidity. In Northern climates their growth has been increased where heating systems combined with poor construction methods prevail.

Subterranean termites consist of three forms; Reproductives, Workers and Soldiers. The individuals of each of these pass through three stages—egg, nymph and adult. The adult workers and soldiers are wingless and are grayish-white in color. The reproductives are brown or black and are provided with two pairs of long white wings of equal size. These wings are usually shed during warm spring weather. Termites may be easily distinguished from ants as a termite does not have a constricted waistline whereas all true ants do. There are approximately sixty species of termites in the United States which may be classified into the following:

EARTH DWELLING TERMITES

A. **Subterranean termites** cause huge economic losses and comprise by far the most important group to control. They require a constant source of moisture that is normally obtained from the ground, and under warm, humid conditions they go back and forth between their home in the soil and the wood or other cellulose materials on which they are feeding.


BETTER KILLS
BETTER JOBS
BIGGER PROFITS
For Fumigating Use
ZYKLON DISCOIDS
No more guesswork. Do better jobs with this handy packaged fumigant. ZYKLON DISCOIDS are ready for instant use. Open the can and scatter the discs into rooms to be fumigated. No corrosive liquids and no dangerous residue. DISCOIDS give off a powerful gas that penetrates into every crack and crevice—kills insects wherever they may be. Send for "Zyklon Discoids Fumigation Manual"—FREE.
For Rat Control Use
CYANOGAS
This is a powder giving off a gas —NOT A BAIT. Kills rats and mice *instantly*. Successful where baits and other means fail. Simply pump the powder into the rat holes. The gas liberated penetrates to all parts of the runs. With a Cyanogas-Foot-Pump-Duster and CYANOGAS A-DUST you can make big profits. Special ruggedly built duster $5.75. Write for free booklet on rodent control.
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KILLS
American Cyanamid & Chemical Corporation
Insecticide Department
30 ROCKEFELLER PLAZA, NEW YORK, N. Y., KANSAS CITY, MO., AZUSA, CALIF.

B. **Desert termites** live on woody parts of desert plants and refuse lumber in desert and arid regions. They occur mainly in the Southwestern United States and are not of great national importance, but as irrigation develops in these areas they will become more of a problem. Their control is similar to that of Subterranean termites.

WOOD DWELLING TERMITES

A. **Dry Wood termites** live as an entire colony in dry, sound wood and usually require a moisture content of 10% or more for existance. They are a constant problem in attacking Utility poles and lumber in Southern California. Dry wood termites work mainly in Southern California, Arizona and the deep Southern portions of the Gulf states. While they create a severe local problem they are not national, and their damage is slight compared to that of Subterranean termites. They can be found in furniture, interior millwork and other dry wood. They may be destroyed by dipping or copiously spraying the lumber with a 5% pentachlorphenol oil solution or by placing the wood in a dry kiln and subjecting it to a temperature of 150° F. It may be necessary to have additional applications, and a careful watch should be maintained until it is certain that all termites are dead.

B. **Damp Wood termites** live in damp and usually decayed wood. They are largely confined to the Pacific Coast from British Columbia to Mexico. They attack wooden water tanks, fresh water piling, decayed stumps and other wooden structures frequently affected with fungus growth. Their control closely follows that of Subterranean termites.

HABITS OF SUBTERRANEAN TERMITES

Termites work in the dark, preferably on inside walls; near heated furnaces, hot water and steam pipes, on the sunny or Southern exposure of homes or other places favorable to warm and humid conditions. Termites will build mud tunnels from moist soil to untreated wood over concrete, stone or treated wood. They have been known to travel over less palatable wood such as Redwood and over the heartwood of many species such as Cypress and Cedar so as to reach and destroy Douglas Fir, Ponderosa Pine and Southern Yellow Pine. They prefer sapwood to heartwood, and eat the cellulose from wood, fibreboard and paper.

Termites groom each other, and are cannibalistic in their habits. They need warm temperatures and high humidity, that is, conditions which promote fungus growth. A study of their habits quickly reveals the methods of combating them.

GOOD CONSTRUCTION METHODS

One of the best methods of preventing damage from Subterranean termites is through good construction and sanitation. Replace wood that has been seriously attacked and damaged beyond repair with new lumber, treated if possible. Clean out all debris, decayed lumber, loosened boards and stumps under and around the house. Destroy all termite tunnels inside and outside of the basement walls. Isolate porches and steps from the soil. Wherever possible use a metal termite shield made with tight joints properly soldered. It has been determined that no termite shield is absolutely effective in preventing movement of termites. A properly constructed and installed termite shield will keep the termite passages in the open where they can be seen and thus eliminate hidden termite attack. Provide ample ventilation under the house and complete soil drainage bearing in mind that anything which tends to keep the structure dry and free from decay, also retards termite attack.

CHEMICAL CONTROL METHODS

Good construction will keep the house in good repair providing the termites are destroyed at the same time. This can be accomplished by the proper use of soil poisons. Their runways should be poisoned so that their feelers, legs and bodies will touch the poison. Then, as other termites groom them, they in turn will die.

They can be eradicated through the use of deep trenches with soil poisoned throughout. It has been found that deep trenches lightly poisoned are more effective than shallow trenches heavily poisoned. Many chemicals have been tried and the ones which have been found to be the most successful over a period of years have the following characteristics:

1. The poison should not only control termite attack but also control decay and mold and be an effective wood preservative.
2. It should be highly toxic to termites and other similar pests and yet have low toxicity to man and pets.
3. It should be free from damaging effects or discoloration of wood, without objectionable odor, and lumber treated with it should be paintable.
4. Perhaps of greatest importance—the permanence of the treatment which should be at least 5 years. This is easiest accomplished through the use of non-aqueous oil solutions.

From experience gained, Pentachlorphenol seems to fulfill these requirements. The Forest Products Laboratory have run accelerated tests in the Canal Zone, Florida, Louisiana and Mississippi on various chemicals for the control of termite attack and decay, and Pentachlorphenol has been one of the outstanding ones when compared with all other chemicals. The U. S. Department of Agriculture, Bureau of Entomology, has approved Pentachlorphenol as a soil poison for termite control, and have also approved it for the control of Lyctus Beetle attack.

Concentrated solutions of Pentachlorphenol are available for use by termite exterminators. These concentrates may be diluted with the proper proportions of fuel oil, kerosene or mineral spirits to obtain the standard ready-to-use solution containing 5% Pentachlorphenol.

Pentachlorphenol is highly toxic to practically all fungi bacteria and other micro-organisms. Its killing toxicity to most wood-destroying fungi including U. S. Forest Products Laboratory No. 517 and **Lenzites trabea** is between 0.002% and 0.008%. The killing concentration of 5% Pentachlorphenol in fuel oil is 0.1% as compared to 0.1% to 0.5% for coal tar creosote.

Pentachlorphenol is a crystalline organic chemical, moderately soluble in oils and other organic solvents, but very slightly soluble in water. Its solubility in water ranges from 17 parts per million (0.0017%) at 70° F., to 50 parts per million (0.005%) at 140° F. The volatility or vapor pressure of Pentachlorpenol is also very low, ranging from about 0.0002 mm of Hg. at 70° to 0.9 at 212° F., the boiling point of water.

APPLICATION

Pentachlorphenol should be applied as a 5% solution when the soil is dry and warm. The soil should be poisoned to a sufficient depth about the walls, pipes, foundations or steps to form an effective chemical barrier. A trench should be dug 8 to 12 inches wide and usually to a depth of about 2½ feet where basements are deep. In basementless areas the trench should be shallow, and care should be used not to undermine the foundation. If the walls or foundations are cracked or porous, it may be necessary to drill them and thoroughly drench with the soil poison.

Decayed or termite-attacked wooden sills should be removed and replaced with new ones in order to obtain a tight job. Interior and exterior portions of the lumber may be sprayed or thoroughly swabbed with a 5% Pentachlorphenol-oil solution. However, effective control has not proved to be possible through spraying or fumigating of the timbers. Preservative treatment of the wood should therefore be considered as an addition to the results that may be obtained through the use of an effective soil poison.

In conclusion, if termites in the ground are separated from the wooden structure, successful results in their control will be accomplished. Mechanical barriers plus Pentachlorphenol as a chemical barrier, will control termite attack.

*A. D. Chapman & Company, Inc., Chicago.

Care of White Mice and Rats

(Continued from page 18)

vide good bedding. Excelsior makes good nesting material.

White mice and rats thrive best in a temperature of about 65° F.

References

More complete information on raising white mice and rats is contained in "Breeding and Care of the Albino Rat for Research Purposes," by Milton J. Greenman and F. Louise Dehring, published by the Wistar Institute of Anatomy and Biology, Philadelphia, Pa.; and in "Pets for Pleasure and Profit," by A. Hyatt Verrill, published by Charles Scribner's Sons, New York, N. Y.

—United States Department of the Interior Fish and Wildlife Service, Wildlife Leaflet 214.

WHAT'S NEW IN PEST CONTROL-PERSONALS

LIEUTENANT ROBERT McAFEE DAVIS, of the Army Air Forces, and son of Prof. J. J. and Madge Davis, was married to Miss Betty Jane Freeland on September 3, 1943 at Lafayette, Ind. Congratulations and many happy landings to Bob and Betty!

Aviator Bob is currently on leave convalescing, the aftermath of a crash landing while in action on the African front, and hopes to be returned to full duty soon. Making light of his serious injuries necessitating operative procedure, Bob, now happily on the mend and with almost selfless modesty, writes: "I would definitely like to get back overseas again and be in on the finish. Africa is quite a place, believe me. I saw a lot of action, but my accident happened far too soon to suit me. I had picked up some flak in my tires following a mission. I had to make a crash landing and my safety belt broke. In order to keep my plane from going over on its nose I pulled the wheel back against my stomach, doubled over it to hold it. The wheel struck into my chest, my head hit something and I woke up in the hospital. One of my engines was shot out. That's about all there was to it, except I was out for the time being as far as flying was concerned."

MATE TAKES MATE: Aviation Machinist Mate, First Class, Everett F. Hoffman, U. S. Naval Air Station, TS-16, P-5, Corpus Christi, Texas, has wooed, won and wed pretty and competent Mary Pallis, the Association secretary in general and the Secretary's girl Friday in particular. The wedding took place on September 11 at the Mary Immaculate Heart of Mary Roman Catholic Church, Brooklyn, N. Y. A reception followed at the Buettners with some thirty guests. It is expected that Mary will continue, for a time at least, as secretary to the Secretary. Our heartiest and heartfelt congratulations to the happy couple.

STRUCTURAL PEST CONTROL LAW TO DETERMINE SUIT: Suit of a contractor named Fox to collect from a client named Baker for work partly done and later finished by a licensed operator has been brought in Oakland, Calif. Baker refuses to pay on the grounds that the work undertaken was structural pest control and Fox being unlicensed is without legal recourse.

WIELDS VERBAL SHILLALAHS: In an earlier series of paid newspaper announcements (commented on at the time in this column), M. A. Sanderson (Manager), Reliable Exterminators (Reg'd), Toronto, Canada, discussed, with some feeling and with gloves off, the then current Canadian political scene. Now, taking up where he left off, he carries on with some trenchantly worded editorial ads in "The Globe and Mail," a Toronto Daily wherein he has purchased space units as large as 775 lines, to attack the policies of political groups and individuals with whom he is in fervid disagreement. A line as to the salty character of the phraseology Mr. Sanderson employs in his "editorials" may be obtained from their pungent headings, to wit: Sugar-Coating the Arsenic; Is Col. Ralston Getting That Way, Too?; Shall Ontario Smell Strong Or Be Strong?; Garlic is Garlic No Matter How You Serve It; If You Don't Vote—Don't "Beef."

WIL-KIL EXTERMINATOR CO., Milwaukee, sets 100% blood-donor record, since all of the firm's employees, including its head, Henry Turrie, his daughter Joyce, his nephew Bill (also employees), have now made blood donations to the Red Cross. The "Milwaukee Sentinel" (Aug. 8) carried a picture, cutlined "Realtors Blood Donors," depicting daughter Joyce, with members of the Milwaukee Real Estate Board, taking a little nourishment, after the event, at the blood-donation center. Congratulations to the members of the Wil-Kil organization for a job well done, which is a habit with them anyway.

FRIDAY THE THIRTEENTH

Most people look on Friday the 13th as an unlucky day, but Grace Forde, daughter of A. L. Forde, thinks it is the luckiest day in her life, for on that day (in August) she married Ensign Roy H. Barker, Jr.

The wedding took place at the residence of Mr. and Mrs. A. L. Forde, 323 Euclid St., Santa Monica, and was attended by more than 200 guests.

The bride and groom are vacationing in the northern part of the state.

HE EATS POISON LEFT FOR MICE

Lief Croch, of San Francisco, a 67-year-old shipyard worker, was one down today in the battle with mice which have been making free with his rationed food.

Several days ago, Croch annointed two slices of bread with strychnine paste and left them for the mice. Yesterday he arose late, and in a hurry to reach work in time inadvertently ate the bread the rodents had ignored.

Doctors, who applied a stomach pump, said Croch will recover.

—*PCO News.*

THE FIRM NAME of Completex Sales Co., 132 West 43rd Street, N. Y. has been changed to Velsor Wright Co., and will be located at the same address, continuing to act as representatives for Associated Chemists, Inc., of Chicago, in the eastern territory.

Fifty-four business blocks in Little Rock have been rat-proofed.

—*Buffalo News.*

KATFISH BRAND

TERMITE HOSE!

AMERICA'S FINEST

FOR 15 YEARS

GUARANTEED TO OUTWEAR AND OUTLAST ANY OTHER HOSE OR MONEY REFUNDED

WHY BUY DATA

★ A 15-Year Proven Product

★ Built for the Job Exclusively

★ GUARANTEED with 42 Years Behind It

★ Years of Use Is Wise Economy

Write Today for Prices and — FREE SAMPLE
Also Rock Wool Hose and Cyanide Hose

"The Rubber House of the Americas"

BROADWAY RUBBER MFG. CO.

529 East Broadway **Louisville, Ky.**

The Rose Exterminator Co. Personnel even get together on having the same dates for anniversaries. Norman and Helen Dold celebrate their wedding anniversary with Bob and Rose Ann Yeager on September 24th. Congratulations. Do we have to say that Norman is of the Chicago office and Bob is of the Cincinnati office of the Rose Exterminator Co?

ORCHID?—or ONION! . . . Mort Prescott, general chairman of the NPCA War Emergency Meeting has devised an interesting Attendance-Booster plan, which has been given the fittingly redolent title of "Orchid?—or Onion!" It works something like this. Those who are serving on the National Committee have been assigned different territories to the end that each would take it upon himself to obtain as many as possible in his territory to attend the St. Louis Meeting.

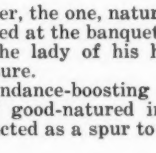
Based on registrations, a mileage figure has been assigned to each of the members of the National War Emergency Meeting Committee, The New York Committee member, for example, received a credit of 900 miles for every person in New York State who attends the meeting, and so on.

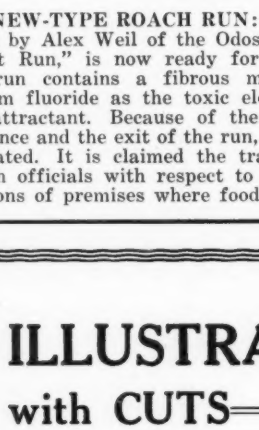
It is anticipated that the name of the winner, the one, naturally, with the highest mileage score, will be announced at the banquet and he will be presented with an orchid which the lady of his heart will be proud to wear that evening, we are sure.

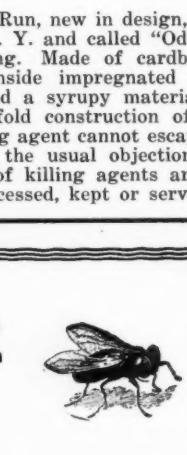
Orchids also to Mort for his novel attendance-boosting idea which has created not only a great deal of good-natured intra-committee rivalry but, more importantly, has acted as a spur to help boost registration figures.

NEW-TYPE ROACH RUN: A roach Run, new in design, patented by Alex Weil of the Odosin Co., N. Y. and called "Odolure Insect Run," is now ready for marketing. Made of cardboard, the run contains a fibrous material inside impregnated with sodium fluoride as the toxic element, and a syrupy material as the attractant. Because of the special fold construction of the entrance and the exit of the run, the killing agent cannot escape, it is stated. It is claimed the trap meets the usual objections of health officials with respect to the use of killing agents around portions of premises where foods are processed, kept or served.

ILLUSTRATE with CUTS—







Write for Prices and Information

PESTS, Cut Dept.

512 East 14th St. Kansas City, Mo.

TO BE RESUMED AT ST. LOUIS WITHOUT FAIL: Anyone who has been to any of the NPCA annual get togethers is aware of a custom that has now become an institution there. Briefly, it consists of Bill Buettner greeting all incoming lady guests, married or single, known or unbeknownst to him, with a resounding smack on the lips. The ladies seem to like the idea (who can blame them?) and Bill has not complained either. This year there is a slight complication. Tom Mahon, Bill's efficient assistant who is going to be at St. Louis, asks what is an assistant for if not to assist, and he has volunteered to take over, in particular, this part of Bill's convention activities. However, we think Tom misses the point (or does he?) and comes War Emergency Meeting time, Bill will solo as usual. So come one, come all, girls. Line forms to the right at the registration desk. Second helpings without request and no ration coupons needed.

PET PROTECTION: Bulletin 470, now available at the Connecticut Agricultural Experiment Station, New Haven, Conn., describes how the owner of farm animals and household pets can guard against their being poisoned by insecticides and harmful plants.

PYRETHRUM PLANTINGS IN CHILE COVER 40 ACRES

Pyrethrum plantings in Chile amount to approximately 40 acres. The 1942 output of pyrethrum powder is reported as 40,000 kilograms. It is hoped to produce 200,000 kilograms of pyrethrum from the 1943-44 harvest, to be available for shipment in April, 1944. The entire output will be purchased by the Commodity Credit Corporation.

MAN vs. MOUSE

Ralph N. Duvall does not like to share his soft drink with a mouse, Duvall, an airline pilot, living at 6447 Kimbark Ave., stated that he landed his plane at Chicago Airport on May 12 and purchased a soft drink from a vending machine. He had finished half of it, he said, when he saw the mouse—inside the bottle. Duvall filed suit in Circuit Court yesterday for $10,000 against the bottling company.

—Chicago Sun.

CAPTAIN W. E. (MAC) McCAULEY has been heard from. He is well. Mac writes he is doing pest control work at present in the Pacific bases, with rat control one of his specialties. Admits he would like to be with us in St. Louis, asks to be remembered to the boys, and welcomes any letters that the boys have time to send. His address: Surg. Office, U. S. Advance Base, A.P.O. 503, c/o Postmaster, San Francisco, Calif.

PCO's in the Pacific: Art Price, who has been associated with W. B. McCloud & Company, recently paid a visit to the Hilts Laboratories, Ltd., and Ernest L. Forde in Honolulu, Hawaii. Also in that sector comes a report that Captain W. W. Dykstra, of formerly the U. S. Fish and Wildlife Service, called on Ernie Forde. Australia continues to give us reports and by way of Houghton & Byrne we find that recent visitors included John Lewis of Buffalo, N. Y., and Captain W. E. McCauley.

A POTENTIAL PCO—Steven Paul threw his 7 pounds 13½ ounces into this world on September 9th and brought much joy to Mr. and Mrs. Walter Roberts of Cliffside Park, N. J. Walter operates the Model Exterminating Company of Jersey City, N. J.

PCO's Active in Pest Control in the Army—Frederick Bowers, Jr. of Rahway, N. J. found that his training under his able dad has served him in good stead in that recently he was assigned to the Medical Section at Camp Lee and is assisting in the fumigation and exterminating work. Abe Charnack of Newark, N. J., owner-operator of the Standard Exterminating Co. of Newark, N. J. now in the Army, has been given a special detail to assist in exterminating work at Fort Dix, N. J.

Notice

We are glad to print personal items of interest. Send us interesting or newsy items about yourself or your family. This magazine is for the pest control industry, and news about YOU is interesting to the rest of us.

PROGRAM
War Emergency Meeting
and
Eleventh Annual Business Session

(Continued from Page 6)

6:00 P. M.—"Dutch Treat" dinner—Adam Room—17th floor.
7:45 P. M.—Annual Meeting of the Board of Directors—Chairmen of all committees invited to attend—Parlor A, Mezzanine Floor.
9:45 P. M.—Open House sponsored by the Order of Standbys—Daniel Boone Room—Mezzanine Floor.

MONDAY MORNING—OCTOBER 25

All sessions held in the Ball Room—Hotel Statler—16th floor.

Registration (8:00 to 9:15 A. M.)

Convention Called to Order at 9:20 A. M.....Morton S. Prescott
National Anthem .....Miss Marion Ross
Invocation .....Rev. Oscar Johnson
President's Annual Message and Report.....F. E. Bohman
Secretary's Annual Report.....William O. Buettner
Treasurer's Annual Report .....Robert C. Yeager
Memorial Service .....H. K. Steckel
Introduction of Distinguished Guests and Visitors .....William O. Buettner
"Wartime Program of the Bureau of Entomology and Plant Quarantine".....Dr. P. N. Annand
Committee Reports .....Chairmen of All Committees
Discussion wil follow each report and action is to be taken if such is required.
Business Session
Appointment of Committees
Announcements and Luncheon Recess

LUNCHEON—12:15 P. M.—Assembly Sections 1 and 2, 16th Floor
"Entomological Folklore" .....Dr. L. H. Haseman

MONDAY AFTERNOON—OCTOBER 25
Ball Room—16th floor

2:00 P. M.—Theme: "Pest Control and the War Effort".....Prof. J. J. Davis, presiding
"Pest Control and the Armed Forces".....Lt. Col. F. C. Mortensen
"What the Entomologist Can Do to Assist Commercial Pest Control Operators".....Prof. E. I. McDaniel
"Wartime Problems of the PCO", Subject Introduced .....William O. Buettner
"War Production Board Policies—Allocations, Priorities, Etc.".....Representative of the War Prod. Board
"Substitutes for Critical Insecticides"

MONDAY EVENING—OCTOBER 25
Ball Room—16th floor

8:15 P. M.—Round Table Discussion.....F. E. Bohman, presiding
Among the subjects to be discussed in the Open Forum will be:
"Manpower"—Both as to the employment situation and deferments.
"Rationing"—Gasoline, tires, supplies, etc.
"Government Forms and Questionnaires."
"Priorities"—Supplies for maintenance, etc.
"Allocations"—Amplification of comments made during the P. M. Session.
10:30 P. M.—The Famous Reunion—All invited.
Assembly Sections 1, 2, 3, 16th floor

TUESDAY MORNING—OCTOBER 26
Ball Room—16th floor

9:15 A. M.—Theme: "Rodent Control".....Martin Meyer, presiding
"The U. S. Fish & Wildlife Service Brings Us Up to Date".....F. E. Garlough
"Research—Formulas in Wartime".....Justus C. Ward
"Co-Operative Experiment—Chicago, Ill.".....Galen C. Oderkirk and Walter S. McCloud
12:30 P. M.—LUNCHEON—Assembly sections 1-2, 16th floor
"Legal Aspects of Pest Control".....John B. Edwards

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TUESDAY AFTERNOON—OCTOBER 26

2:00 P. M.—Theme: "Fumigation"....Bartlett W. Eldredge, presiding

"Fumigation for the Armed Forces and for the Home Front".....Dr. George H. Chapman, J. Carl Dawson, Conrad C. Johnson and Charles W. Houghton

"New Developments in the Conservation of Food from Insect Attack".....Dr. Richard T. Cotton

"Building a Successful Fumigation Service".....C. A. Vincent-Daviss

(A general discussion with opportunity for questions and answers will form an important part of the Rodent Control and Fumigation Sessions and to be continued in the evening Round Table Discussions.)

TUESDAY EVENING—OCTOBER 26

Ball Room—16th floor

8:15 P. M.—Round Table Discussion—
Rodent Control .....Martin T. Meyer, presiding

9:30 P. M.—Round Table Discussion—
Fumigation .....Bartlett W. Eldredge, presiding

WEDNESDAY MORNING—OCTOBER 27

9:15 A. M.—Ball Room—16th floor.....F. E. Bohman, presiding

"Registration of PCO's".....B. G. Berger

"The NPCA and Legislation"—Introduced by....William O. Buettner

"St. Louis Legislation with Reference to the PCO".....John Buxell

"Factors Affecting Efficiency of Fly Sprays"....Prof. Roger C. Smith

"Rogues Gallery"—"Importance of Photography in Pest Control".....Walter S. McCloud

11.15 A. M.—BUSINESS SESSION

(a)—Unfinished business

(b)—New business

(c)—Report of Nomination Committee

(d)—Election of Officers and Directors

(e)—Discussion with regard to next annual meeting

12:30 P. M.—LUNCHEON—Assembly Sections 1-2, 16th floor

"Rat Control: A City Administration's Point of View".....Miss Frieda Schicht

WEDNESDAY AFTERNOON—OCTOBER 27

2:00 P. M.—Theme: Termites and Roaches

(a) **Termite Control Clinic**.....Bert Lewis, presiding

"Research Tests".....Ira Hatfield

"Termite Control Progress".....Dr. Thomas E. Snyder

(b) **Roach Clinic** .....Dr. George L. Gould

WEDNESDAY EVENING—OCTOBER 27

6:30 P. M.—BANQUET

Remarks by President, President-Elect and Secretary

"Entomologically Speaking".....J. Allman Denning

Entertainment followed by Dancing under direction of Jack Field.

LADIES' PROGRAM

All ladies are invited to attend any and all Sessions of the War Emergency Meeting and Eleventh Annual Business Session. The permanent headquarters for the ladies throughout the Sessions are

SUNDAY—OCTOBER 24

All early arrivals meet in Daniel Boone Room, Hotel Statler, at 1:00 P. M. for directions for sight-seeing trip to include Forest Park Zoo and Jewel Box, enroute to tea. The Committee is sorry transportation cannot be furnished because of War conditions. Street cars and busses are available. For those who prefer taxi cabs, suggestion is made groups make arrangements for taxi cab service, thereby reducing expense per person.

From 3:00 to 5:00 P. M., Tea and informal Reception at Raley's Home, 106 Aberdeen Place, Clayton.

At 9:45 P. M. pay a visit at the Open House sponsored by the Order of Standbys in the Daniel Boone Room on the Mezzanine Floor.

MONDAY—OCTOBER 25

At 11:30 A. M. the ladies will meet at Ladies Headquarters and go in a body to the Missouri Athletic Club, 405 Washington Avenue, where luncheon will be served. Mrs. Frances Fivecoate will favor with a book review. The remainder of the afternoon will include sight-seeing in downtown St. Louis.

At 10:30 P. M. a cordial reception awaits all at the Famous Reunion to be held in Assembly Sections 1-2-3 on the 16th floor.

TUESDAY—OCTOBER 26

At 10:00 A. M. the ladies are requested to meet promptly at the Ladies Headquarters and in a body enjoy a sightseeing tour, arriving at Chase Hotel at 12:30 P. M. for luncheon. A view of the city from the roof garden will be interesting. Following the luncheon, sightseeing will continue and include Eugene Field Home, Mosaics in New St. Louis Cathedral, and other famous landmarks of St. Louis.

The evening program is to be arranged to suit individual desires. Details wil be explained at the luncheons.

WEDNESDAY—OCTOBER 27

The entire day has been left free so that the ladies can do shopping or take such trips as they may desire. The Ladies Committee will be pleased to be of any assistance in helping to make these arrangements as well as to make reservations at any local beauty salons.

At 6:30 P. M. there will take place the Annual Banquet with entertainment features followed by dancing under the direction of Jack Field.

It is the sincere wishes of Mrs. Thomas C. Raley and members of the Ladies Committee to extend every courtesy to make your stay in St. Louis a pleasant one. We will be ready at all times to assist you—do not hesitate to call on us.

Red Tape

ANTS—

At a Georgia air base a harassed captain sat down and wrote this note:

"To: Medical Supply Officer:

"1) Following telephone information from your office that you were unable to issue carbon disulphide for use in this office in ant control, and following receipt of your letter listing insect repellents furnished by your office, request was made of Quartermaster for carbon disulphide for use by this office in ant control. We were informed by Quartermaster that they could only issue such preparation if the ant to be exterminated was in the building. If it was outside the building, the issuance of such preparation properly should come from Engineering. It is difficult to determine the intentions of the ants we are attempting to exterminate. Some live inside and wander outside for food, while some live outside and forage inside for food. It is a rather difficult problem to determine which ant comes from without and is what you might call an Engineering ant, and which ant comes from within and would be called a Quartermaster ant. Some of our ants appear to be going in circles and others apparently are wandering at random with no thought of destination. Such ant tactics are very confusing and could result in a Quartermaster ant being exterminated by an Engineering poison, or an Engineering ant exterminated by a Quartermaster poison, which would be contrary to the letter of regulations and would probably lead to an extensive investigation and lengthy letter of explanation.

"2) In view of the fact that Quartermaster-issued poison has been found to kill an ant just as dead as Engineering-issued poison —and vice versa—request is made that your office draw identical poisons for issue to this office from both Engineering and Quartermaster, and mix same so that there will be no way of knowing which poison killed the ant—the assumption being that no well-bred G.I. ant would eat other than poison issued through proper channels to final destination, which destination being the aforementioned dead or dying ant."

*Other notable victims: *Empress of Britain*, 42,000 tons; *Statendam*, 29,000 tons; *President Coolidge*, 22,000 tons. The Germans' own 50,000-ton liners, *Bremen* and *Europa*, have been reported damaged or destroyed by fire, either from bombing or sabotage.

—*Time* 9-6-43.

War on Rats to Be Studied in Milwaukee

Partly because of the fact that Galen C. Oderkirk of the Fish and Wildlife Service will discuss an interesting rat project under way in Chicago at the NPCA War Emergency Meeting this month, and partly because the question of rat campaign vs. rat project has been very much to the forefront in industry interest, a news story of a projected rat campaign, emanating from Milwaukee, is of particular relevancy at this time.

Summarized, it says: "A vigorous campaign to exterminate the growing rat population in Milwaukee will be under way soon if the common council approves a plan prepared recently by Dr. E. R. Krumbiegel, health commissioner. The proposal provides that all of the city's 1500 policemen, ash collectors, garbagemen, inspectors and meter readers be recruited into a rat-detector corps to find and report on places infested by rodents." The health commissioner weighed various plans, including one by Alderman B. B. Kroenke that "ash collectors be armed with rat poison to exterminate the rodents wherever they are found." Aware of the danger to children and pets in the indiscriminate use of poisons, Dr. Krumbiegel suggested that "the army of city employees be used to detect runways and feeding places of rats and then report their findings to department heads, who in turn would notify the health department." The public, too, is to play its part in cleaning up its backyards, ratproofing (provided materials are available), etc., according to the article.

Obviously, what is here envisaged is an intensive rat campaign of short duration,—one that in the past has been more often a political football than an effective means of rat control—instead of a continuous rat program, which, while not as spectacular as a campaign in operation, will, if it is under competent supervision and in skilled hands, accomplish the requisite results. Which is not to say, however, that Dr. Krumbiegel's proposed campaign to do something about the menace of Milwaukee's unwanted rats is not commendable as far as it goes, but we believe that experience has shown and will continue to show, as already indicated, that it does not go far enough.

For consideration of the PCO in his contacts with local health departments, apropos the question of a rat campaign vs. rat program, W. O. Buettner, secretary of the NPCA, offers some timely, relevant thoughts in a letter to a member of the industry. They are:

"1. Reference and study of Service Letter No. 290.

2. Dr. G. C. Sherrard's* article "A Plan for Rodent Control in Cities." (July-'43-Pests.)

3. The necessity of a year-round program and some attention probably given to a seriously infested area first.

4. Hand out a few summons as well as place violations on some of the flagrant unsanitary conditions that prevail.

5. Certainly it does not make sense to have laymen distribute poisonous baits and use lethal fumigants. Since the elimination part of any rodent control project might be viewed as third in the list of importance, nevertheless such work should be confined to experienced personnel; towit, PCOs who are trained to deal with poisoned baits, lethal gasses, etc.

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New York City.

6. Visualization to the nth degree would undoubtedly make the public more fully understand the necessity of the part that must be played by the citizens. Take a few photographs of the unsanitary sections of the city and publish them. The necessity of cleaning up harborages and other debris as well as rat-proofing are important parts that can be played by the public."

In conclusion, says Mr. Buettner: "Let's outline a program that makes some sense rather than jumping right into a 'campaign.' Campaigns' savor too much of the political interests whereas a 'program' year round—probably not as spectacular—will bring results."

*Senior Surgeon, U. S. Public Health Service.

We Could Use Him

There might be a suggestion for the Buffalo health board in a story from Washington to the effect that one Jim Young has just trapped himself out of his job as official rat-catcher for the United States Capitol.

It seems that Mr. Young just got too good. He conducted an intensive campaign against the capitol rats which reached a high point of 72 rats in one night. He caught so many rats that he practically eliminated them from the Capitol. The situation is so much under control that Mr. Young has gone back to his regular full-time job as a $120-a-month janitor.

If Mr. Young could handle the rat-catching assignment for the nation's Capitol, he undoubtedly could handle a bigger assignment—like, say, Buffalo. We have the rats and we could use somebody like Mr. Young. And maybe pay him a couple of dollars more than $120 a month.

Buffalo Courier.

Government at Work on Rotenone Supply

War Food Administration expects that about 5,000,000 pounds of rotenone-bearing material will be imported into the United States during the next 12 months, according to latest information.

That amount would mean a substantial increase over last year. The industry is not quite so optimistic; its members foresee something like 4,000,000 pounds. It is pointed out also that a substantial portion of the root now being brought in is relatively low in rotenone content; for that reason tonnage figures may be misleading.

Commodity Credit Corporation will do its best to find and to bring in more rotenone, according to Courtney C. Brown, vice-president of that agency.

IMPORTANCE OF PCO IN WAR WORK HIGHLIGHTED BY FORMER PCO

In describing the similarity in method of Army pest control and the one employed by a Chicago pest control firm—a method which was used as part of an Army rat-control project in which civil authorities cooperated, to help rid the area of plague, rat instigated, Art Price, former W. B. McCloud & Co. (Chicago) employee and current member of the Armed Forces, has emphasized anew the continuous need for and the strategic importance of pest control and the operator in war work.

Stationed in one of the Hawaiian Islands, an island in which rats and Bubonic plague seemed to be getting the upper hand, necessitating drastic and immediate control measures, Art Price, who participated in the rat project there, notes, in a letter to Walter, that there is a continuous service here (in the Army) conducted a great deal like McCloud's, with a number of men operating out of a laboratory resembling McCloud's in that the same type of mixers, the same chemicals are used, etc. It smells just like it too," he recalls, "with phosphorous paste, meat and different grains." Moreover, he declares, "the Army cooperates with the civil authorities by trapping the rats and it is our function to immerse them in kerosene and bring them to the lab. for examination." Art, meanwhile, who has applied for transfer to the Sanitary Corps, says further: "the mongoose has also been introduced in the islands to help get rid of the rats."

BRITAINS WARS ON RATS

London—Food Minister Lord Woolton, announcing a "colossal" offensive against rats, said that rats and mice each year destroy or foul 2,000,000 tons of food.—Courier.

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Studies of Methyl Bromide, Chloropicrin, Certain Nitriles and Other Fumigants Against the Bedbug[1]

(Continued from Page 10)

the older nymphs, these results being similar to those of Mayer (1934) and Busvine (1938). The addition of ethylene dichloride to ethylene oxide in a proprietary mixture appeared to increase its efficiency slightly when compared on the basis of equal dosages of ethylene oxide. Ethylene dichloride alone appeared to have little if any toxic effect at these concentrations.

1-Nitropropane seemed to be about as effective against the bedbug as against the flour beetle (Richardson et al. 1943). Preliminary tests with 1-nitrobutane and nitroethane indicated them to be less toxic in that order, the results differing from those with the flour beetle.

o-Dichlorobenzene appeared to be similar in toxicity to 1-nitro-propane. Bedbugs fumigated with o-dichlorobenzene became very active and appeared to be much irritated. It is important to note, however, in a report of an English committee on bedbug infestation (Cameron 1942), that o-dichlorobenzene was rejected as a bedbug fumigant or spray because of its danger from the health standpoint.

Methylallyl chloride, which has been recommended as a fumigant in Europe (Briejer 1938, 1939), was among the less toxic compounds. The closely related compound methylallyl bromide was less toxic, contrary to results with the flour beetle..

Tetrachloroethane was among the less toxic materials, although more toxic than the closely related compound ethylene dichloride. It vaporized very slowly at room temperature. A mixture of tetrachloroethane and trichloroethylene has been patented by Balazs (1939) for use against bedbugs. In the present work a 1:1 mixture (by vol.) gave 98, 100, and 100 per cent kill of nymphs, adults, and eggs, respectively, compared with 71,100, and 100 per cent given by tetrachloroethane tested at the same tetrachloroethane dosage (30 mg. per liter). Trichloroethylene alone at about the same dosage had little if any killing action, but it did have an unusual anesthetic action, for all the insects appeared paralyzed at the end of fumigation but were completely recovered by the next day.

Ethylene dichloride was relatively low in toxicity. Preliminary tests indicated that it had some delay killing action between the sixth and twentieth days after fumigation, but by no means to the extent it had in previous work against the flour beetle. The addition of carbon tetrachloride did not appear to increase its efficiency. Carbon tetrachloride alone was also among the least toxic chemicals tested.

Fumigation Efficiency in an Unloaded Steel Cylinder.—Most of the chemicals found to have the highest toxicity in the flask tests were tested three to five times in the unloaded steel cylinder together with two organdy-covered Petri dishes containing insects, one being wrapped in 6 to 8 layers of cotton batting. In general, the gases tested had no difficulty in penetrating the cotton. For example, in five paired tests with various dosages of acrylonitrile and four with chloropicrin the percentage mortalities of the older nymphs were as follows:

No one can predict how long the war will last, what conditions will prevail immediately thereafter, or what further new developments will occur in the meantime.

However, there are three points on which we can be so definite as to practically remove them from the field of prophecy to that of certainty.

1. Insecticides will be different, more varied, better suited to the specific purposes for which they will be recommended and more effective.

2. Pyrethrum may be substituted by other insecticides for some purposes but in general, it will remain unchallenged in regard to its two great advantages—rapid action on insects and freedom from toxitis to people. Its use will increase, not diminish.

3. D & O will maintain the leadership in the field which they have established in the last two years.

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Acrylonitrile		Chloropicrin	
Nymphs exposed directly	Nymphs wrapped in cotton	Nymphs exposed directly	Nymphs wrapped in cotton
100	99	97	98
100	100	93	84
97	99	60	66
94	98	45	58
13	25		

Similar results were obtained with chloroacetonitrile, methyl bromide, 1,1-dichloro-1-nitroethane, di- and trichloroacetonitrile, ethylene oxide and its mixture with ethylene dichloride, and ethyl formate.

In the case of acrylonitrile, chloropicrin, 1,1-dichloro-1-nitroethane, and methyl bromide, the concentrations required for 95 to 100 per cent kill in the unloaded steel cylinder were approximately the same as those found necessary in the glass flasks. With hydrocyanic acid, chloroacetonitrile, di- and tri-chloroacetonitrile, ethylene oxide-ethylene dichloride mixture, and ethyl formate, however, somewhat higher concentrations were required in the steel cylinder. The reason for this is not known at this time.

Fumigation Efficiency in a Loaded Steel Cylinder.—Some of the more toxic fumigants were given preliminary tests in the heavily loaded steel cylinder (3 pounds of clothing per cubic foot of space) to determine the penetrative powers into cotton batting and woolen blankets exposed directly to the gas or packed in the center of a bag of clothing. A uniform dosage of 20 mg. per liter (20 ounces per 1,000 cubic feet) was used. The results are shown in table 2.

Table 2.—Efficiency of several fumigants against bedbugs wrapped in various materials to test for penetrative powers under heavily loaded conditions. Dosage, 20 mg. per liter. Five-hour exposures at 77° F. and normal atmospheric pressure.

CHEMICAL	Percentage Mortality of Bedbugs Wrapped in—								
	Cotton Batting			Woolen Blanket			Woolen Blanket in Barracks Bag		
	Older n'phs	Ad'ts	Eggs	Older n'phs	Ad'ts	Eggs	Older n'phs	Ad'ts	Eggs
Methyl bromide	100	100	100	100	100	100	100	100	100
Chloropicrin	100	100	100	100	100	100	100	100	100
Hydrocyanic acid	100	100	100	100	100	100	61.3	96.7	100
Acrylonitrile-carbon tetrachloride mixture (1:1 by vol.)	100	100	100	92.8	100	100	20	25	20.5
Trichloroacetonitrile	94.5	97.5	96.8	75	100	100	64	89.4	98.3
1,1-Dichloro-1-nitroethane	76.6	97.5	78	66.7	97.9	84.3	31.5	67.4	54.3
Ethylene oxide	37.7	—	—	17.8	—	—	24.2	—	—
Chloroacetonitrile	30.6	75	—	1.9	7.3	—	14.8	14	—

The mortality figures indicate that the woolen blanket placed in the center of a bag of clothes furnished the most difficult test of penetration.

These and other tests at dosages of 16 and 18 mg. per liter indicate methyl bromide and chloropicrin to be the most efficient chemicals under the heavily loaded test conditions. They were used at only about 2 and 3 times, respectively, the dosages required to kill in an empty flask or cylinder. On the other hand, hydrocyanic acid at 20 to 30 times the killing dosage gave irregular results and appeared slightly less efficient. Acrylonitrile-carbon tetrachloride mixture at a dosage to give 20 mg. of acrylonitrile per liter, or about 8 to 10 times the killing dosage, was next in efficiency, followed closely by trichloroacetonitrile and 1,1-dichloro-1-nitroethane.

Trichloroacetonitrile at less than twice its killing dosage gave much higher efficiency than chloroacetonitrile used at 5 to 6 times its killing dosage. It is a colorless liquid with a boiling point of 85° C. Its gas is nonflammable. It aerated rapidly from clothing at the temperature tested and might well be considered for further study. Peters (1940) states that it has about the same toxicity to warm-blooded animals as ethylene oxide and methyl-allyl chloride, but there is little danger of poisoning because of its great warning property. Its vapor is very heavy (sp. gr. 4.95, air=1).

Ethylene oxide was near chloroacetonitrile in efficiency against nymphs.

In a further test at 18 mg. per liter methyl bromide and chloropicrin seemed to be very close in efficiency. The mortalities of older nymphs caused by methyl bromide were 98.6, 94.7, and 100 per cent in cotton, blanket, and blanket in clothes, respectively, compared with 100, 100, and 93 per cent for chloropicrin. Both gases are practically nonflammable. Chloropicrin has strong warning properties and appeared to have little if any effect on fumigated clothes, but its relatively low vapor pressure might restrict its efficiency at lower temperatures. Methyl bromide has a high vapor pressure and it appeared to have little effect on the clothes or leather shoes under the test conditions maintained.

Summary.—Twenty-six chemicals or mixtures were tested as fumigants against the eggs, nymphs, and adults of the bedbug (**Cimex lectularius** L.) in 12-liter glass flasks; some of the more toxic chemicals were also tested in a 7.7-cubic-foot steel cylinder. Approximately 150 five-hour fumigations were made at 77° + or — 0.9° F. with approximately 15,000 eggs and 30,000 nymphs and adults.

In the fumigations in empty glass flasks hydrocyanic acid was the most toxic gas. It was followed by acrylonitrile and its mixture with carbon tetrachloride, chloroacetonitrile, chloropicrin, and dichloroethyl ether. Slightly less toxic in the descending order were 1,1-dichloro-1-nitroethane, methyl bromide, di- and tri-chloroacetonitrile, and ethylene oxide.

The additon of carbon tetrachloride to acrylonitrile (1:1 by vol.) to produce a nonflammable mixture also gave increased efficiency.

Chloropicrin was more effective against the eggs than against the older nymphs and adults.

The second to fifth instars were generally the most resistant and the eggs the least resistant. This relationship varied with some chemicals, the egg being most resistant to dichloroethyl ether and trichloroethylene. The egg was much more susceptible to ethylene oxide. Trichloroethylene had an anaesthetic action against the active stages.

In tests with the more toxic materials in an unloaded steel cylinder the efficiency was just as great against insects protected by cotton batting as against those exposed directly to the gas.

In a loaded steel cylinder methyl bromide and chloropicrin were the most efficient gases when used at a dosage of 16 to 20 ounces per 1,000 cubic feet(against bedbugs wrapped in cotton batting or in woolen blankets exposed directly to the gas, or packed in the center of a 25-pound barracks bag (3 pounds of clothing per cubic foot of cylinder space). Hydrocyanic acid appeared slightly less effective, followed by acrylonitrile-carbon tetrachloride mixture, trichloroacetonitrile, 1,1-dichloro-1-nitroethane, ethylene oxide, and chloroacetonitrile, listed in the approximate order of descending efficiency.—4-5-43.

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Mosquito-Repelling Chemical Made for Army, Navy to Beat Malaria

By WILLIAM L. LAURENCE

Pittsburgh.—An impenetrable chemical wall against malaria-carrying mosquitos, which promises to answer the acute problem of quinine shortage for America's fighting forces in the jungle areas, was described here today at the opening sessions of the annual autumn meeting of the American Chemical Society.

The new chemical wall is an insect-repellent four to six times more lasting in its effect than any other similar substances hitherto known. Some details of its performance are still a military secret, but it is already safeguarding American soldiers and marines in areas infested with mosquitos, it was reported by Drs. Philip Granett, G. C. Furness and W. Rudolfs of the New Jersey Agricultural Experiment Station, Rutgers University, one of the group of chemists who synthesized the new chemical.

The chemical, known only as formula 612, promises to be the chemists' answer to Japan's cutting off the natural quinine supply in Java. Formula 612 promises to be much better than quinine, or similar anti-malarial drugs, for these chemicals do not cure malaria, whereas the new synthetic chemical acts as a preventive against that scourge of mankind.

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A Texan PCO's Son Comes Into His Own In the Army

Though there has been criticism leveled in some quarters in the past because of the contention that pest control is a second line in defense of public health, the war certainly has rendered this criticism untenable, if it ever had any validity in the first place. In fact, the "essentiality status" accorded the Industry by the War Manpower Commission merely formalized what had been a fact for a long time.

If it is true that an army travels on its stomach, it is equally true that an army will be better fed, travel faster and maintain higher health standards if rigid control of pests is maintained at all times. Added evidence that the Army is keenly aware of this comes via a letter from Pvt. Ralph Abel (son of H. O. Abel, Abel Exterminating Co. of Dallas, Texas), stationed on New Caledonia Island and attached to the Surgeon's Office, Service Command, to which he was transferred after receiving training as a machine gunner. The Surgeon's Office, he writes, is disturbed about evidences of plague on the island, rat caused, and means to prevent its spread. As a result he has been appointed exterminator for the entire island —whereon are located a large number of Government warehouses—with a staff of five men under his supervision. He acts principally, he advises, in an advisory capacity and trains the men in each unit in methods of rat control for their respective areas. Moreover, he has a truck assigned to him in which to get around and now inspects all incoming boats, too. A tall order at 22, or at any age, for that matter.

Pvt. Abel, who, it is expected, soon will be given technical stripes commensurate with his rating, passes along a suggestion for a rat trap now in use on the island, which, while not altogether new in concept, may be of value. Its use here, however, should be tempered by the consideration that the species of rat found out in the isles of the Pacific may not be the same as the brown rat prevalent in our part of the world.

The trap suggestion advanced by Pvt. Abel works something like this: Take an oil drum and cut the top out of it. Paste about 4 thicknesses of paper and cover the open top like a snare-drum. Then cut an X in the paper and place bait on each of the pointed corners. Before covering top, place two bricks inside the drum, one on top of the other, and pour in water until it almost covers top brick. Place a board over the drum for a run. When the rat runs out on the board and jumps down to get the bait, he falls through the trap. He then climbs out of water onto the brick and begins to raise hell. Other rats are attracted by the noise and when two or more get in they fight over the brick. After a good many get in, the water rises and drowns them. While this may sound like something out of "Rube Goldberg," says Ralph, it has been used with great success by soldiers over here.

Pyrethrum Supplies For Home Front To Be Virtually Nil

(Continued from Page 5)

6. In Columns 3 and 4 (Primary product and product end use) specify the use to which pyrethrum ordered will be used, as follows:

(i) If your use is to be agricultural, whether on crops, in dairy barns or otherwise, specify "agricultural."

(ii) If use is by Army, Navy, U. S. Maritime Commission, War Shipping Administration, or other Government Agency, so state, and also indicate destination, preference rating, if any, and how material will be used.

(iii) If use is neither in agriculture nor by a government agency, state as accurately as possible specific purpose to which the pyrethrum ordered will be put.

(iv) If application is for resale, applicant will specify "resale" and will indicate the general class of use for which he proposes to resell the pyrethrum ordered.

(v) Applicant will fill out completely Table II, and will leave blank Tables III, IV and V.

Pyrethrum Allocations

A circular, titled "Pyrethrum Allocations Are Practically Nil",* issued to the trade by Harold Noble, manager Insecticide Division, S. B. Penick & Co., N. Y., under date of September 3, 1943, discusses not only the current and prospective pyrethrum supply situation, but also gives some constructive advice with respect to filling out supply forms under WPB Order M-179, amended August 30, 1943.

In a supplementary statement on September 7, apropos this circular, Mr. Noble declares: "One important development resulting from the urgency of the army's requirements is that War Food Administration may be unable to permit use of Pyrethrum on essential food crops in quantities sufficient to meet the production program from 1944. Pyrethrum has been used extensively as an agricultural insecticide, for example, on beans, cabbage and corn. Further restrictions could seriously affect urgent food production, more of which is needed as the war effort progresses. The several governmental agencies concerned clearly have a most delicate problem before them. The one ray of hope is that production of Pyrethrum Flowers at the origin is being stimulated broadly and in one to two years we may have an abundance of supplies rather than a scarcity.

*Copy may be had by addressing S. B. Penick & Co., N. Y.

Suppliers Comment on the Pyrethrum Situation

HAROLD NOBLE, ***Mgr., Insecticide Division, S. B. Penick & Co., New York.***

A CIRCULAR issued by this concern, under date of September 3, discusses not only the current and prospective pyrethrum supply situation, but also gives some constructive advice with respect to filling out supply forms under WPB Order M-179, amended August 30, 1943.

In a supplementary statement on September 7, apropos this circular, Mr. Noble declares: "One important development resulting from the urgency of the army's

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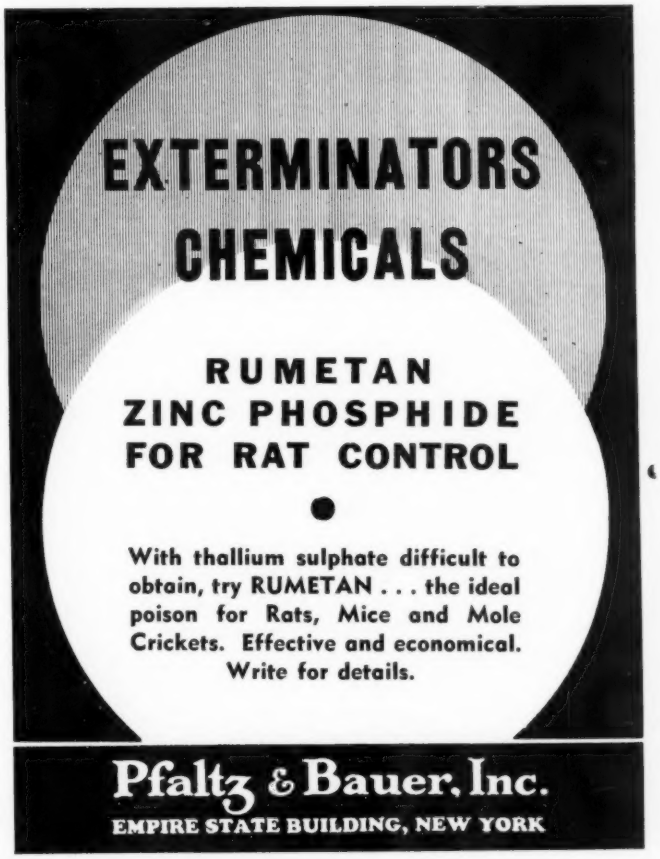
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requirements is that War Food Administration may be unable to permit use of Pyrthrum on essential food crops in quantities sufficient to meet the production program from 1944. Pyrethrum has been used extensively as an agricultural insecticide, for example, on beans, cabbage and corn. Further restrictions could seriously affect urgent food production, more of which is needed as the war effort progresses. The several governmental agencies concerned clearly have a most delicate problem before them. The one ray of hope is that production of Pyrethrum Flowers at the origin is being stimulated broadly and in one to two years we may have an abundance of supplies rather than a scarcity."

JOHN POWELL, *John Powell & Co., Inc., N. Y.*

"As most Pest Control Operators know, the outlook for Pyrethrum for the balance of this year is not too good, and while those in charge in the War Production Board have made an effort to take care of Pest Control Operators, the supply of raw material is so extremely small that their hands are to all intents and purposes tied.

The demand from the Armed Forces is overwhelming, and with the extremely short crop in Kenya Colony, it is not foreseeable just when the situation will improve.

Government agencies are striving very hard to increase the supply, and it may be that sometime in 1944 the situation will ease somewhat, but this is more hope than anything else, inasmuch as the Army and Navy will undoubtedly need everything that is available for sometime to come.

Despite the fact that the Armed Services have been prevailed on to utilize Pyrethrum more advantageously, the poor crop, due to excessive rains and the shortage of labor, made it impossible for suppliers to change the immediate outlook."

R. B. STODDARD, *Insecticide Dept. Dodge & Olcott Co., N. Y.*

In a circular to the trade, headed "Pyrethrum and WPB Order M-179", Mr. Stoddard says, in part: "The pyrethrum situation remains acute so far as supplies are concerned. Arrivals have been light during the last five months, and this situation will continue for several months to come. Some improvement may be expected after the first of the year, but how much is problematical.

In the meantime, the urgent military requirements seem likely to absorb practically all available supplies. In this connection it should be clearly understood by everyone that the military authorities are not using pyrethrum indiscriminately. Its military use is severely curtailed to employment in malaria control program, and then only in the more critical areas, and under rigid limitations.

Even so, under present supply conditions these requirements leave little if any pyrethrum for other uses. To what extent it may be possible to reserve a certain proportion for the most essential agricultural uses is still undetermined, but the amount will be very limited."

R. J. Prentiss & Co., Inc., N. Y.

In its circular "Pyrethrum Powder—Cube Powder" this concern discussed the necessary procedure on the part of the PCO to effect allocation of Pyrethrum Powder or Cube Powder through WPB.

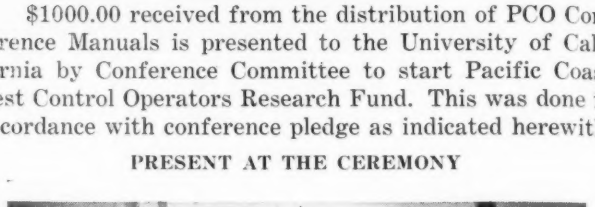
Above all, each company circular stressed the necessity, on the part of the PCO, to comply with the regulations listed in WPB Order M-179, revised August 30, 1943, when placing orders for pyrethrum.

Copies of any or all of the circulars above indicated may be obtained by writing the companies direct.

Berkeley, California, September 11, 1943

$1000.00 received from the distribution of PCO Conference Manuals is presented to the University of California by Conference Committee to start Pacific Coast Pest Control Operators Research Fund. This was done in accordance with conference pledge as indicated herewith.

PRESENT AT THE CEREMONY



Standing, left to right—

Dr. W. S. Mangold—Sanitarian, Student Health Service, U. C.
Dr. E. G. Linsley—Instructor in Entomology, U. C.
Dr. A. E. Michelbacher—Junior Entomologist, U. C.
Dr. G. F. MacLeod—Professor of Entomology, U. C.
Dr. M. A. Stewart—Associate Professor of Entomology, U. C.
Dr. W. M. Hoskins—Associate Professor of Entomology, U. C.

Seated, left to right—

Fred A. Taylor—Assistant Director, Department Professional and Vocational Standards, State of California.
E. O. Corson—Chairman, Conference Program Committee and Past President Structural Pest Control Board.
Professor E. O. Essig, Acting Head of the Department of Entomology and Parasitology.
R. V. Haneberg—Registrar and Treasurer, Pacific Coast Pest Control Operators Conference.

This Conference Committee has pledged all profits, except a small fund set aside as a future conference fund, to be turned over to the Department of Entomology and Parasitology of the University of California as a research fund to be used in the interests of the pest control industry and the public it serves.

Small Sprayers in Prospect

Pest Control Operators will be glad to learn of the prospect of a million small sprayers to be made available for use in the home and by the industry. The sprayers will be largely of the one pint size and distribution will be through the insecticide manufacturers. Distribution by the manufacturer will be allocated in accordance with orders on hand.

It was formerly planned to make spray guns with glass bowls but the impracticability of this idea caused its abandonment. The original order was also somewhat indefinite in that it was not certain whether household insecticides and sprayers were essential. Hence, the use of tin plate in the manufacture of hand sprayers for household use, could not be allowed. A further consideration of this order led to the amended order allowing the use of tin plate in the manufacture of all hand sprayers for disinfectant and pest control purposes. As a result the sprayers should be available in the near future.

Patent Suit on Termite Control Dismissed

October 27, 1936 the United States Patent Office granted Termite Control Patent Number 2,059,095 to Evan L. Fellman, Memphis, Tenn., assignor to E. L. Bruce Company, Memphis, Tenn. There are fifteen claims made in this patent and for some time termite control companies were wondering when there would be attempted a suit based on infringements of the claims stated in the patent. Such suit ultimately became a reality, the E. L. Bruce Company vs. Contract Waterproofing Company. G. B. Schley of Schley & Trask of Indianapolis, Ind. was the attorney for the Contract Waterproofing Co.

As this case developed the plaintiff (E. L. Bruce Company) through preliminary court proceedings said it would rely on claims 5, 7 and 12 of the patent. Quoting from a copy of the patent, these claims were:

No. 5 "Method of termite control for a building containing a wood superstructure supported on a foundation resting on the ground, comprising poisoning the ground closely adjacent to the foundation with an insecticide that contains a non-volatile toxicant and covering the top of the foundation at all points of contact of the wood superstructure and the foundation with said insecticide to thereby provide a double barrier to prevent passage of termites to and from the wood superstructure."

No. 7 ' Method of termite control for a building with wood sills supported on a foundation resting on the ground, comprising boring holes in the wood sills adjacent their points of contact with the foundation, feeding into the holes an insecticide that contains non-volatile toxicant in a quantity sufficient to cover the top of the foundation at all points of contact with the wood sills and hereby act as a barrier to prevent passage of termites to and from the wood superstructure."

No. 12 "In combination, a wooden building structure provided with wood sills supported on a foundation resting on the ground and having a coating of a solid toxicant on its entire underside, at every point through which termites might travel from and to the ground in their passage to and from the wooden building structure, including the bottom of the sills resting on the foundation."

Several termite control firms throughout the country supplied information which file is being held intact and which is to be made available as, if and when it is necessary. Under date of July 31st there came the terse announcement "The plantiff, E. L. Bruce Company, dismissed the suit against the Contract Waterproofing Company on July 23, 1943."

No reason was given as to why E. L. Bruce Company dismissed the case but it would appear obvious that several reasons suggest themselves. Foremost among such reasons may be that it was realized that many operators had used similar methods covered by the patent several years before it was applied and these operators were prepared to appear at any court proceedings.

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GAS—HOT OR COLD?

Bulletin discusses the question which arises occasionally as to the advantage of a "hot" gas over "cold" gas, the hot gas being represented as hydrocyanic acid generated by the pot method and the cold gas being represented by the "canned" product, for example in the form of Zyklon Discoids. Bulletin also contains some helpful notes on gas mask canisters and bedbugs.

WRITE PESTS, A-C-68.

BELLOWS

New-type bellows, made of materials non-essential to war effort, described in circular. Manufacturer states though no springs are used in the bellows they can be operated with one hand. They contain no valves and are quick-filling through the opening in the nozzle. Available in sizes for professional and resale purposes.

WRITE PESTS—CENTRO.

THE ACTIVATING EFFORT OF PYRETHRUM UPON THE GERMAN COCKROACH

Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.

WRITE PESTS—PYRETHRUM.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

FUMIGATION NOTES:

Discusses spread of Discoids; reinfestation; effects on vegetables and eggs.

WRITE PESTS, AC58.

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FUMIGATION AND PLASTICS

News release discusses use-co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.

WRITE PESTS—DOW

HOUSEHOLD SPRAY FACTS

Manufacturer's bulletin discusses Lethane's killing power, range of insect control, cost, chemical stability, spray formulas, etc.

WRITE PESTS—ROHM & HAAS.

PYRETHRUM - DERRIS - RED SQUILL PRODUCTS

Leaflet describes foregoing insecticides with special bait chart for use in connection with powdered red squill.

WRITE PESTS—PRENTISS.

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48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

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DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.

WRITE PESTS—STANLEY.

SODIUM SILICO FLUORIDE

Bulletin describes sodium silico fluoride product with proper density. Effective manner of testing for presence of HCN after ventilation also discussed.

WRITE PESTS—AC 70.

RECHARGEABLE STORAGE FLASHLIGHT BATTERIES

Literature describes permanent type of rechargeable flashlight battery which eliminates worry about a dry cell shortage, due to the use of critical materials, and can, it is stated, equal in use as many as 400 or more dry cells. Instead of constantly using new cells and throwing them away, you simply recharge the battery and it's "just like new" again, manufacturer states. The addition of a few drops of distilled water and regular charging is all that is necessary for an unlimited amount of bright, steady light.

WRITE PESTS—IDEAL.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

MOLE KILLER PELLETS

Circular describes mole killer pellets which manufacturer states requires no traps, no gas, no exposed poison. Diagram of runways and explains how mole lives. Testimonial letters.

WRITE PESTS—CARAJON.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions best as an antidote to HCN poisoning, and where obtainable.

WRITE PESTS—A-C-73

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period, temperature, aeration, precautions.

WRITE PESTS—DOW

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.

WRITE PESTS A-C-74

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.

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MILITARY FUMIGATION MANUAL

This special 48 page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCOs who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE PESTS—AC.

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